DOCUMENT RESUME

ED 218 980 FL 013 097

AUTHOR	Trites, R. L.; Price, M. A.
TITLE	Assessment of Readiness for Primary French Immersion: Grade One Follow-Up Assessment.
INSTITUTION	Ontario Dept. of Education, Toronto.
REPORT NO	ISBN-9-7743-5348-1
PUB DATE	80
NOTE	337p.; For related documents, see ED 159 931 and ED 188 443.
AVAILABLE FROM	Ontario Government Bookstore, 880 Bay Street, Toronto, Ontario, Canada M7A 1L2 ($6.00).
EDRS PRICE	MF01/PC14 Plus Postage.
DESCRIPTORS	Academic Achievement; Achievement Rating; Aptitude Tests; Educational Research; Family Characteristics; Fles; Foreign Countries; French; *Grade 1; *Immersion Programs; Kindergarten Children; *Learning Readiness; Parent Background; *Predictive Validity; *Predictor Variables; *Preschool Tests; Primary Education; Young Children
IDENTIFIERS	Canada; *Early Identification Assessment Battery

ABSTRACT

This follow-up study helped determine the predictive validity of parent and teacher ratings and scores from the Early Identification Assessment Battery. This assessment involved a random selection of 4-year-old children scheduled to enter a French immersion program in the Ottawa, Canada, school system. In the spring of grade 1, 63% of the original group were still in French immersion; these children were classified as high or low achievers based on their teachers' ratings and on tests of academic achievement in English and French. The data indicated that highly accurate predictions of progress in French immersion programs could be made on the basis of the 4-year-old assessment battery. The significant predictor variables included IQ measures, tests of spelling and word segmenting, naming of letters and numbers, auditory discrimination, and color naming. The test scores were far more accurate than background and family variables in predicting achievement. Sample questionnaires and test batteries are appended. (SW)

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Grade One Follow-Up Assessment

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**This research project
was funded under contract
by the Ministry of Education
Ontario**

FL013097

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Dr. Bette Stephenson, Minister
H.K. Fisher, Deputy Minister

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Queen's Park
Toronto, Ontario

Printed by the University of Ottawa Press

Additional copies may be ordered from:

The University of Ottawa Press
65 Hastey Avenue
Ottawa, Ontario
K1N 6N5

or

Ontario Government Bookstore
880 Bay Street,
Toronto, Ontario
M7A 1L2

Ministry of Education Cataloguing in Publication

Trites, R.L.
Assessment of readiness for primary French immersion: grade one follow-up assessment / R.L. Trites, principal investigator; M.A. Price. --

"This research was funded under contract by the Ministry of Education, Ontario."

1. French language - Study and teaching - English students. 2. Education, Bilingual - Ontario. 3. French language - Study and teaching (Primary) - Ontario. I. Price. M.A. II. Ontario. Ministry of Education. II. Title.

ON01651 372.6541 UTLAS: 54011978

ISBN 9-7743-5348-1

ABSTRACT

Two years of study into the characteristics of children who experience difficulty in French immersion led to the discovery of a test profile characteristic of the learning difficulty group. The present report describes a test battery designed to predict the likelihood of success and level of achievement of children in French immersion based on scores obtained prior to their entry into such a program.

In the first phase of this prospective early identification investigation, an extensive psychometric test examination combined with detailed parent and teacher ratings was obtained on almost one half of randomly selected children scheduled to enter a primary French immersion program in an Ottawa school board. The measures were obtained in the Spring of the English four-year-old kindergarten program prior to enrolment in a French immersion kindergarten program. In the second phase, the predictive validity of the measures obtained in the four-year-old kindergarten was assessed in terms of criterion measures of academic achievement in English and French obtained in the Spring of five-year-old French immersion kindergarten. This report, the third and final phase, presents the predictive validity of the variables obtained in the four- and five-year-old kindergarten evaluations assessed in terms of measures of achievement in English and French in the Spring of the grade one program.

Eight-five per cent of the initial sample of 200 four-year-old children were successfully followed through the three detailed phases of assessment. A total of 63% of the original group were still in French immersion and the progress of those children was classified as high or low achievers based on their teachers' ratings and on tests of academic achievement. In spite of Bright-Normal to Superior intelligence, 25 children, one half on the recommendation of the school, had dropped out of the French immersion program.

Analysis of the extensive data obtained indicated that highly accurate predictions of subsequent progress in a French immersion program, whether it would be to experience great difficulty and drop out, or to stay in and be a high or low achiever, could be made on

the basis of the four-year-old Early Identification Assessment Battery. The significant predictor variables were quite heterogeneous and included IQ measures, tests of spelling and word segmenting, naming of letters and numbers, auditory discrimination and color naming. The test scores were far more accurate than either background variables, such as socio-economic class and other family characteristics or teacher ratings, in predicting achievement.

In view of the generally far less successful results of other early identification studies, the results of this program are surprising. The fact that the task in this investigation was to predict relative rates of progress amongst a group of children who were select in having high ability levels and favoured socio-economic status made the task even that much more difficult. It is very likely that the reason for the high levels of success of this program was due to the fact that a clear and specific deficit has been linked with learning difficulty in primary French immersion, whereas the reasons for school failure in conventional programs are multiple and often poorly understood.

ACKNOWLEDGEMENTS

We would like to express our appreciation to the principals and teachers of the Ottawa Board of Education who cooperated in this investigation; to the parents and children who were involved; to Ms. Danielle Ferron for her supervision of the follow-up assessment; and to Ms. Lisa Smith for her assistance in the administration of the Grade One Follow-Up Assessment Battery.

This research was made possible through the financial support of the Ministry of Education, Ontario, and their assistance is gratefully acknowledged.

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INTRODUCTION

In Canada, an increasing interest in English-French bilingualism has resulted in the development of several alternatives for the teaching of French to English-speaking school children. In the primary, or early, French immersion program, English-speaking children are exposed to French as the exclusive language of instruction in kindergarten (half-days) and grade one, with instruction in the English language being introduced and gradually increased in later grades. The grade at which instruction in the English language is introduced may vary. Alternatively, exclusive instruction in the French language may be introduced at grade six, seven or eight constituting a late French immersion program. Some school boards have opted for a bilingual or partial French immersion program in which French is the language of instruction for one half of the school day, and English is the language of instruction for the remaining half day. This program may begin in kindergarten or grade one. Traditional "French as a second language" (FSL) programs involve teaching French as a subject for various time periods (25, 30, 60 minutes) at various grade levels. Occasionally, FSL programs are supplemented by offering various subjects taught through the medium of the French language.

Parents generally have a choice among some of these alternative French programs. They attempt to choose the French program which appears to be the most appropriate program for attaining the level of English-French bilingualism desired for their children. Frequently, the first choice point is between primary French immersion or the regular English program at the five-year-old kindergarten level. However, parents have few well-established guidelines to help them to make this choice. Nor do teachers have validated predictive procedures to guide them in making recommendations regarding the advisability of enrolment in primary French immersion. The study to be presented represents the final year of a three year follow-up study designed to validate a set of variables predictive of success or failure in the primary French immersion program.

Variables Related to Success or Failure in French Immersion Programs

Recent studies in this area are presented below. The reader is referred to previous publications for an in-depth discussion of issues in second language learning (Trites and Price, 1976, 1977) and variables related to success in French immersion programs (Trites and Price, 1976, 1977, 1978).

In a study concerned with Learning Disabilities Found in Association with French Immersion Programming (Trites and Price, 1976), it was found that children who had difficulty in primary French immersion were distinct from children diagnosed as having a primary reading disability, minimal brain dysfunction, a primary emotional disturbance or as being hyperactive. The children who had difficulty in French immersion had a unique pattern of deficits. This group had a high IQ and excellent motor and sensory functions, and yet performed the most poorly on a complex psychomotor problem-solving task. The findings were interpreted as evidence of a maturational lag in the temporal lobe regions of the brain.

It is known that the temporal lobes are important structures in subserving verbal and non-verbal perceptual functions, as well as containing the auditory centres of the cerebral cortex.

Trites and Price (1977) undertook a cross validation of the above findings using a nonclinical sample. Sixteen children who had dropped out of French immersion (Drop-out) were matched for age and sex with 16 children who began in the same French immersion class as the Drop-outs, but who were still doing well in the French immersion program (Controls). The Control group was characterized by higher scores on IQ tests, a higher socio-economic level, and a history of starting nursery school at an earlier age compared with the Drop-out group. The neuropsychological profiles of Drop-outs and Controls were substantially different. With IQ controlled statistically, these groups differed on the behavior rating scales and specialized reading subskill tests of oral reading and comprehension. The earlier finding of a tactual performance deficit suggesting a maturational lag in the temporal lobe regions of the brain was evident in the Drop-out group. The difference was statistically significant in younger children (below age nine), but, consistent with a maturational lag hypothesis, the differences had disappeared in the over-age-nine group, although the trend was still in favour of the control group. The results of these two studies suggest that children who experience difficulty in French immersion differ from children who are successful. It is possible that the variables on which they differ may be identified before enrolment in primary French immersion and used to predict success or failure in the program.

Barik and Swain (1976) compared children enroled in a primary French immersion program with children in the regular English program from kindergarten through grade four. Over the five-year-period, the French immersion group had a significantly higher IQ than the English program group. It was suggested that the grade four group may have represented a very select sample in that children with lower IQ's may have experienced difficulty in French immersion and dropped out over the years. Further evidence that IQ was related to success in French immersion was indicated by the significantly higher IQ of children who were high achievers (top third on measures of proficiency in French) versus the low achievers (bottom third).

Genesee (1976) examined the role of intelligence in second language learning for children in three French immersion situations: grade four of an early immersion program, and grades seven and eleven of a late immersion program introduced at the grade seven level. Children were classified as "Below average" if they obtained a Full Scale IQ score of 95 or less on the Lorge-Thorndike Test of Intelligence. The mean IQ score of the "Below average" group in grade four was 95. There were no "Below average" students at the grade eleven level. "Average" students had an IQ score between 96 and 115. "Above average" students obtained an IQ score greater than 115. "Above average" students outperformed the "Average" students who outperformed the "Below average" students on measures of French reading, French language usage and mathematics skills measured in French. IQ levels did not affect measures of interpersonal communication (eg., listening pronunciation). However, in interpreting these findings one must consider the generally high ability levels of children in French immersion programs and the possibility that children of lower ability do not enrol in such programs, or drop out at an early level. The sample in the above study was comprised of very able students as indicated by the absence of a "Below average" IQ group in grade eleven and IQ levels in the average range for the lowest ability group in grade four.

In a study of the effects of preschool experience upon grade one achievement, Lokan, Halpern, Day and Brooks (1976) found that children who had attended four-year-old kindergarten and children who had attended nursery school performed better on some achievement tests at the beginning of grade one compared to children who had not attended these programs. However, this relationship was not apparent at the end of grade one. Investigation of home variables related to preschool attendance indicated that nursery school attenders had more favorable home backgrounds (for example, parents read to the child more frequently and there were more books in the home) than nonattenders. In addition, Lokan and Day (1976) reported that significantly more children in the French immersion program attended nursery school compared to children in the English program group. The relationship between nursery school attendance and home background variables led the authors to suggest that children in grade one French immersion programs tend to come from more advantaged homes than children in regular grade one programs. Nursery school attendance was not related to success in French immersion in this study, and this area warrants further investigation.

Bruck (1978) examined the suitability of primary French immersion for the language disabled child. Achievement levels of children with language disabilities (FP) and normal controls (FC) enroled in primary French immersion were compared to children with language disabilities (EP) and normal controls (EC) enroled in the regular English program. THe progress of the children was follwed from kindergarten to grade three. Bruck (1978) concluded that "children with language-learning problems who attend French immersion programs can develop linguistic, cognitive and academic skills at a rate similar to that at which they would develop were they placed in an all-English classroom" (p. 65). She concluded that children who encounter difficulty in French immersion should remain in the program and receive remedial assistance in the

French language. However, the validity of these conclusions must be viewed with caution. The language disabled children in the English program had significantly lower Performance IQ scores in kindergarten and in grade three compared to the language disabled children in the French immersion program. Nonverbal aspects of cognitive functioning may influence which children remain in French immersion and which children transfer out of the program. The problem group in French immersion had the highest attrition rates of all groups and the children who remained in the program to grade three likely represent a select, more able group compared to the problem group in the English program. Trites and Price (1977) found that the children who transferred out of the French immersion program had a lower Verbal IQ and were experiencing a greater degree of academic difficulty than children who remained in French immersion in spite of difficulties. Thus, one must consider that the groups compared by Bruck (1978) may not have been disabled to the same extent and that the more disabled children did not remain in the French immersion program to the end of the longitudinal study. In addition, the progress of the problem groups in English reading tended to be at or above grade level. This suggests that the initial diagnoses of language disability are questionable. It should also be noted that progress in the French language of problem children in French immersion was measured up to the grade three level by a test appropriate for grade one children. The scores at grade two and three may represent ceiling effects.

Predicting Success in French Immersion Programs

Studies by Trites and Price (1976, 1977) indicated that not all children of above average intelligence and having excellent motor and sensory skills experienced success in primary French immersion programs. Although parents' decisions to enrol a child in French immersion may be guided by informal and widely used selection procedures, not set of variables has been validated as predictive of success or failure in French immersion programs.

There have been very few attempts to determine variables predictive of later achievement in primary French immersion programs. Edwards and Smythe (1976) assessed the predictive validity of measures obtained in grade one French immersion in relation to performance on measures of English and French achievement in grade four French immersion. Two different sets of significant predictors were found for two samples, with teacher ratings of behavior among the best predictors.

Swain and Burnaby (1976) attempted to relate personality characteristics of kindergarten children, as rated by teachers, to French language achievement scores obtained in kindergarten, grade one and grade two. Perfectionist tendencies correlated highly with second language achievement. Quickness in grasping new concepts was also related to second language achievement.

Tourond, Thomson, Lokan and Hendelman (1977) assessed the predictive validity of a specially developed Checklist of French Immersion Kindergarten Teacher Observations in relation to measures of achievement in French administered at the end of kindergarten and grade one French immersion. The Checklist was found to have validity as a measure of readiness. However, it had only marginal validity as a predictor of achievement in French.

Tucker, Hamayan and Genesee (1976) and Genesee (1978) administered sets of predictor and criterion tests at the grade seven level to children who had been in French immersion since kindergarten, to children beginning a late immersion program and to children in a regular English grade seven program. Highly motivated students with high need achievement and positive attitudes towards the French language and its speakers tended to be high achievers on French measures. The attitude-motivational predictor was important for all criterion measures.

Carroll (1975) reported an extensive evaluation of the teaching of French in eight countries to three age groups: ten-year-olds, fourteen-year-olds and end of high school. Analyses of variables predictive of success in reading French and in the comprehension of French indicated that the quality of instruction, students' motivation and Verbal IQ were important predictors. The amount of French instruction was found to be important, but the age or grade when French instruction was introduced was not a significant predictor. In English-speaking countries, sex was related to achievement in French, with girls favoured. This extensive study points to the possibility that a set of predictors of achievement in a particular program of French instruction will be found.

Although there is a dearth of studies attempting to predict success or failure in French immersion programs, there has been considerable research devoted to the prediction of success or failure in school, or in handling specific aspects of the school curriculum, especially reading. Many factors have been investigated in relation to school achievement: sex (Wand, 1974; Faust, 1970), socio-economic status (Faust, 1970), preschool experience (Huberty and Swan, 1974; Lokan, Halpern, Day and Brooks, 1976), IQ (Dykstra, 1965; Adelman, Feshback and Fuller, 1973; Plant and Southern, 1968), language factors (Newcomer and Hammill, 1975), visual discrimination (Barrett, 1965), visuo-motor ability (Koppitz, Sullivan, Blyth and Shelton, 1959; Keogh and Smith, 1967, 1970), auditory discrimination (Dykstra, 1965), readiness skills (deHirsch and Jansky, 1966; Goodstein, Owen and Cawley, 1975; Ferinden, Jacobson and Linden, 1970; Hopkins and Sitkei, 1969), behavior ratings (Adelman, et al., 1973; Attwell, Orpet and Meyers, 1967; Keogh and Smith, 1970; Novack, Bonaventura and Merenda, 1973), and so on. The reader is referred to Trites and Price (1978) for an in-depth review of studies concerned with the prediction of success in school.

Successful screening of children, i.e. the identification of children who are likely to encounter difficulties in some aspects of the school curriculum, is viewed as an important goal. With such procedures, steps can be taken early in a child's career to avoid programs in which he is likely to encounter failure, to design remedial techniques suitable for the child and to encourage flexibility in existing programs so that the needs of individual children will be met. Early failure in a school program can be very harmful to a child and should be avoided whenever possible (Kohlberg, La Crosse, and Ricks, 1972).

Assessment of Readiness for Primary French Immersion

The early identification of children who are a high risk for failure in a primary French immersion program is the goal of a three year study which began during the 1976-77 school year. This report presents the third and final phase of this study which was designed to identify a set of variables predictive of success or failure in primary French immersion programs.

In the first phase of this project, measures were obtained for children in the Spring of their English four-year-old kindergarten program prior to enrolment in a primary French immersion program. In the second phase, the predictive validity of the measures obtained in four-year-old kindergarten was assessed in terms of criterion measures of academic achievement in English and French obtained in the Spring of five-year-old French immersion kindergarten. Additional measures of psychomotor problem-solving ability and readiness skills of listening comprehension and problem-solving were also obtained in the second phase to be evaluated as predictors of future achievement in the grade one program. In the third phase, reported here, the predictive validity of the variables assessed in the four- and five-year-old kindergarten evaluations was evaluated in terms of criterion measures of achievement in English and French in the Spring of the grade one program. The findings of the first two phases of study are summarized below.

I. Four-year-old Kindergarten Early Identification Assessment

The first phase of the three year study is described in detail elsewhere (Trites and Price, 1978). Biographical and background information and teacher ratings were obtained for approximately 1,000 children in the Spring of their English four-year-old kindergarten program. The results indicated describable patterns of differences between children entering five-year-old French immersion kindergarten and children entering English kindergarten.

Descriptive information collected for these children indicated that there were differences in terms of the characteristics of families of children entering different school programs, i.e. French immersion versus the regular English program. Children entering French immersion tended to come from higher socio-economic status and more advantaged homes, compared to children entering the English program. The French immersion enrolments were also treated differently by their parents in that they attended preschool more frequently and were read to at home more frequently.

Parental attitudes towards the French language also differed. Parents who intended to enrol their children in French immersion tended to express greater interest in speaking or learning to speak French themselves, compared to parents choosing the English program. Parents' reasons for choosing or not choosing French immersion appeared to be based upon the educational goals that they considered to be important, for example, functional bilingualism versus a solid grounding in English language skills. The choices were frequently made irrespective of the child's particular learning characteristics and seemed to reflect more a "life-style" decision.

It was found from the teacher ratings that consistent, although informal, criteria were used in either recommending or not recommending children for primary French immersion programs. The criteria for advising against enrolment were different from the reasons usually cited in recommending French immersion enrolment.

In the first phase, the Early Identification Assessment Battery, which included measures of intelligence, readiness skills, language abilities and problem-solving abilities, was administered to 200 of the 1,000 four-year-old kindergarten participants. The sampling procedures by which these 200 children were selected from among over 450 children who were to be enroled in five-year-old French immersion kindergarten in September of 1977 are described in detail in Trites and Price (1978). Comparisons between the sample and other children entering five-year-old French immersion kindergarten indicated that the sample was representative of children entering French immersion following four-year-old English kindergarten. The predictive validity of the data obtained from the intensive assessment of the sample of 200 children was to be evaluated in terms of outcomes in five-year-old kindergarten and in grade one.

II. Five-year-old Kindergarten Follow-up Assessment

The detailed report of the second phase of this study is presented elsewhere (Trites and Price, 1979). One hundred and eighty-four of the 200 children assessed intensively in the first phase were located for the follow-up assessment. One hundred and fifty-nine children were in French immersion kindergarten; six children had transferred to the English program; eleven children were enroled in the English kindergarten program and not in French immersion; seven children were enroled in a bilingual program; one child was in French immersion grade one and another child was in an English grade one program.

The predictive validity of the measures obtained in four-year-old kindergarten was assessed in the light of measures of achievement obtained for the 159 children in the five-year-old French immersion program. Step-wise multiple linear regression analyses and Pearson product-moment correlations were computed for 35 predictors of the Early Identification Assessment Battery and 11 criterion variables of the Kindergarten Follow-up Assessment Battery.

Better prediction was accomplished for measures of English language achievement than for measures of French language achievement. Predictions of achievement in French and in English was related to similar measures including colour and picture-naming in English; readiness measures of quantitative concepts and of knowledge of letters and numbers; arithmetic scores, expressive language skills in English and behavior ratings by examiners and teachers. IQ was of greater importance in predicting achievement in the English language than when predicting achievement in French. Of considerable interest in light of the earlier studies (Trites and Price, 1976, 1977), tactual performance test scores entered into the multiple regression equations for French measures but not for English language measures.

Important differences were found at the four-year-old kindergarten level for groups of high and low achievers formed on the basis of percentile scores on a measure of French comprehension. Differences were also found among achievement groups formed on the basis of five-year-old kindergarten teachers' ratings.

These findings indicated that identifiable relationships and differences may eventually be used to predict a group of children who will not progress well in the French immersion program. Further follow-up of the progress of the children in increasingly demanding academic programs was necessary to confirm and further delineate the predictive validity of the four-year-old kindergarten measures and selected five-year-old kindergarten measures.

III. Grade One Follow-up Assessment

The third and final phase of the assessment of readiness for primary French immersion is presented in this report. In this phase of the research study, attempts were made to locate the 184 children who received the Early Identification Assessment Battery in the Spring of 1977 and the Kindergarten Follow-up Assessment Battery in the Spring of 1978. The predictive validity of the measures obtained in four-year-old kindergarten and of selected predictors obtained in five-year-old kindergarten were evaluated in the light of outcome measures in the Spring of the grade one program for the children who were in the French immersion program at the end of grade one and for children who had dropped out of French immersion and transferred to an English program. Criterion measures were proficiency measures administered in both French and English.

THE SAMPLE

Of the 184 children retested in the Spring of 1978, 169 were retested in May and June of 1979. Fifteen children had left the Ottawa area or could not be located for a reassessment. Two parents requested that their children not be reassessed. This represents a total attrition rate of 15.5% from the original sample of 200 children assessed in four-year-old kindergarten in the Spring of 1977.

The number of children attending various school programs in the Spring of 1979 are presented in Table 1. One hundred and twenty-four children were enroled in French immersion grade one. One hundred and

TABLE 1

School Programs in the Spring of 1979

School Program Attended	Number of Children
French immersion program:	
Grade one	124
*Grade two	1
*Repeating kindergarten	1
English program:	
Grade one (transferred before 1978 assessment)	5
Grade one (transferred before 1979 assessment)	20
Grade one (never in French immersion)	10
*Grade three (never in French immersion)	1
*Grade one (transferred from bilingual program)	1
Bilingual program:	
Grade one	5
French school:	
*Grade one (transferred from bilingual program)	1
TOTAL	169

*Children omitted from the analyses.

twenty of these children attended 11 schools of the Ottawa Board of Education. The remaining four children were enroled in French immersion programs in three schools of the Carleton Board of Education. In the French immersion program, French is the language of instruction for the five-year-old kindergarten program (half-days) and for the grade one program. Reading and spelling are introduced in the French language in grade one. The children receive English Language Arts instruction for 10 to 20% of the school day. However, no English reading or spelling are taught in the grade one program.

Twenty-five children had transferred from French immersion to the English program. Five of these children had transferred to the English program before the assessment in the Spring of 1978. The 25 Drop-outs were dispersed among 20 schools of the Ottawa Board of Education, three schools of the Carleton Board of Education, one school of the Carleton Separate School Board and two private schools. In the English grade one core French program, children are instructed in French as a second language for 20 to 40 minutes daily. The emphasis is upon oral skills. No reading and writing in French are introduced at the grade one level.

Eleven children in the English program had never been enroled in the French immersion program. In the Spring of 1979, nine children were inthe English grade one program, one child was in a special school for children with learning disabilities and one child was in an English grade three program. A twelfth child had transferred from a bilingual program to an English grade one.

Five children were enroled in the bilingual program of the Ottawa Separate School Board. Three of these children had attended a bilingual kindergarten. Two children had attended French immersion kindergarten. The bilingual program consists of a full day kindergarten program and a full day grade one program during which French is the language of instruction for one half-day and English is the language of instruction for the other half-day. In the bilingual grade one program, Social Studies, Science, Physical Education, Visual Arts and Language Arts are taught in French. Children are taught to read and write in both French and English. The teaching is usually coordinated across the two languages.

Five children were enroled in alternative school programs in the Spring of 1979 and they were excluded from the analysis. One of these children had advanced to grade two French immersion. A second child repeated French immersion kindergarten and continued to experience difficulty in the program. A third child had transferred from a bilingual program to a grade one program in a French school. A fourth child transferred from the bilingual program to an English grade one as a result of parental dissatisfaction with the bilingual program. The fifth child had never been enroled in French immersion and had advanced to grade three in the English program.

PROCEDURE

Grade One Follow-up Assessment Battery

The measures obtained at the end of the grade one program are presented in Table 2. The complete

TABLE 2

Grade One Follow-up Assessment Battery

I. French Language Measures[1]

- French Comprehension Test, Level One
- Test de Rendement en Francais, Level One
- Peabody Picture Vocabulary Test (French)
- Knowledge of Numbers and Alphabet in French
- Picture-naming (French)

II. English Language Measures

- Wide Range Achievement Test
- Renfrew Action Picture Test
- Peabody Picture Vocabulary Test

III. Rating Scales

- Test Behavior Observation Guide (Observer Checklist)
- Conners Teacher Questionnaire
- Grade One Teacher Ratings
- Parents' Questionnaire

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[1] The French Language Measures were not administered to children who had never been in French immersion or the bilingual program.

Grade One Follow-up Assessment Battery was administered to all children who had attended French immersion or the bilingual program, including the children who had switched to an English program before the grade one follow-up assessment. Measures of French language skills were not administered to children who had never attended a French immersion or bilingual program.

Children attending the French immersion program were assessed in their schools. Children attending the bilingual program came to the Neuropsychology Laboratory, Royal Ottawa Hospital, for an individual testing session. Children in the English program were assessed in their schools.

The measures obtained in the Spring of 1979 are described in detail below.

(i) French Language Measures

French Comprehension Test, Level one: Barik (1976)
The French Comprehension Test is designed to measure the French comprehension skills

of English-speaking pupils in immersion programs who have received all of their school instruction in French throughout kindergarten (half-days) and grade one.

- Raw score and percentiles.

Test de Rendement en Francais, Level one: (1973-74 edition).

This is a test of reading achievement in French at the grade one level developed by La Commission des Ecoles Catholiques de Montréal.

- Raw score and stanine.

Peabody Picture Vocabulary Test (French).

This test is a French translation of Form A of the Peabody Picture Vocabulary Test (Dunn, 1965) to be used as a measure of receptive vocabulary in French.

- IQ and Mental Age scores.

Knowledge of Numbers and the Alphabet in French.

The children were required to name in French the 13 alphabetic characters of the Wide Range Achievement Test (Jastak and Jastak, 1965) reading subtest, to count the 15 dots and identify the five numbers from the arithmetic subtest in French. The number of letters correctly named and the number of dots counted and numbers named correctly were recorded.

Picture-naming (French).

The child was required to name in French, as quickly as possible, 20 black and white pictures laid out in five horizontal rows. The time required to complete this task and the number of pictures incorrectly named were recorded. These scores were subtracted from constants (1,000, 100 respectively) so that higher scores represented better performance.

(ii) English Language Measures

Wide Range Achievement Test (WRAT): Jastak and Jastak (196

- Reading, spelling and arithmetic grade scores and percentiles.

Renfrew Action Picture Test: Renfrew (1971).

Expressive language measure: information and grammar scores based upon the child's verbal descriptions of nine pictures.

Peabody Picture Vocabulary Test:

a) Form B (Dunn, 1965).

This test is a measure of receptive vocabulary in English.

- IQ and Mental Age scores.

b) Form A.

Form A items are presented in a novel manner designed to measure reading vocabulary. The child was required to read each item typed on an index card and to pick out the appropriate corresponding picture.

- IQ and Mental Age scores were obtained using Form A norms for receptive vocabulary presentations.

c) Form B - Form A.

The discrepancy between the child's receptive vocabulary and reading vocabulary was calculated.

(iii) Rating Scales

In addition to the psychometric measures administered to the children, the examiner, teachers, and parents completed the rating scales described below.

Test Behavior Observation Guide (Observer Checklist): Atwell, Orpet and Meyers (1971).

Following the individual testing session, the examiner rated the children's behavior during testing on ten nine-point scales. (See Appendix 1).

Conners' Teacher Questionnaire: Conners (1969)

The teachers rated each child on 39 items related to classroom behavior, group participation and attitude toward authority. These ratings yield percentage scores reflecting conduct problems, inattentive-passive behavior, tension-anxiety and hyperactivity. This questionnaire was available in English and French to accommodate the teacher's preference. (See Appendix 2).

Teacher Ratings:

The teachers rated each child in terms of his comprehension of French, oral skills in French, reading skills in French, present functioning level and willingness and confidence in the French language. Information concerning recommendations for future enrolment in French immersion, school difficulties during the current year and special help requirements was gathered. This rating scale was available in English and French to accommodate the teacher's preference. (See Appendix 3).

Parents' Questionnaire:

Parents submitted information concerning their child's progress and adjustment in the school program attended (French immersion, English or bilingual program). Problems encountered or special help required were noted. Parents were asked to indicate the school program and grade level that their child would attend in September of 1979. Reasons for the enrolment decisions for the 1979-80 school year were noted.

Parents of children who had dropped out of French immersion and transferred to the English program were asked to indicate the reasons for the transfer, their satisfaction with the child's progress in each program, and the child's attitudes towards each program. (See Appendix 4).

Statistical Analysis

Considerable data has been gathered for the 169 children followed from the Spring of 1977 to the Spring of 1979. In the first year of the study, parents completed an extensive Biographical and Background Information Questionnaire. (See Appendix 5). Parents' educational plans for their children, their view of their child's progress in school and of available school programs were collected in the five-year-old kindergarten and grade one follow-ups. The reader is referred to the report of the five-year-old Kindergarten Follow-up Assessment (Trites and Price, 1979) for a detailed presentation of the parents' questionnaire data at the five-year-old kindergarten level. The parents' questionnaire data from the grade one assessment are discussed in the present report.

Teachers' ratings of the children were collected at the three grade levels of interest in the Assessment of Readiness for Primary French Immersion. The rating forms completed by the four-year-old and five-year-old kindergarten teachers are included in Appendices 6 and 7, respectively.

Individual assessment batteries were also administered at the three grade levels of interest. The four-year-old kindergarten Early Identification Assessment Battery is included in Appendix 8. The reader is referred to the initial report in this series for a detailed description of these measures (Trites and Price, 1978). The five-year-old Kindergarten Follow-up Assessment Battery is included in Appendix 9. The reader is referred to the second report in this series for a detailed description of these measures (Trites and Price, 1979).

Responses to open-ended items on the Parents'

Questionnaires and Teacher Ratings at the three grade levels were categorized and coded in terms of the categories developed. All of the data was coded and stored on magnetic tape for computer analysis. The test data and questionnaire data from the grade one follow-up assessment was combined with the test data and questionnaire data collected in the Spring of four-year-old and five-year-old kindergarten. Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975).

RESULTS AND DISCUSSION

The results will be divided into five main sections. The children attended four different grade one programs, namely, French immersion grade one, English grade one following some time spent in French immersion, English grade one with no time spent in French immersion, and bilingual grade one. In the first section of the Results and Discussion, these four groups will be described in detail and compared briefly for descriptive purposes.

In the second section, the children in the French immersion program and children who dropped out of French immersion will be compared in detail. In the third section, children who had academic difficulty in French immersion and dropped out of the program will be compared extensively with children identifed as low achievers in the French immersion program and with children identified as high achievers in French immersion. The final two sections concentrate upon the group of children who remained in French immersion to the end of the grade one year. Low achievers and high achievers will be compared in a discriminant function analysis. The validity of the Early Identification Assessment Battery and of the Kindergarten Follow-up Assessment Battery in predicting relative rates of success in French immersion will be assessed in relation to criterion measures of achievement in French and English at the end of French immersion grade one in stepwise multiple linear regression analyses.

Grade One Enrolment Groups

Four grade one enrolment groups will be described: 124 children enroled in French immersion grade one (French immersion group), 25 children who dropped out of French immersion and transferred to the English program (Drop-outs), 10 children enroled in the English grade one program who had never been in French immersion, and five children enroled in a bilingual grade one program (Bilingual group). The French immersion and Drop-out groups are the main focus of this study and extensive comparisons of these groups will be presented in later sections. Data for the English and Bilingual groups are presented for descriptive purposes. These two groups will not be involved in the extensive analysis.

Drop-out Group

The Drop-out group was composed of 25 children who transferred from French immersion to the English program. Five children had transferred during the five-year-old kindergarten program before the follow-up in the Spring of 1978. Two children transferred in the late Spring of five-year-old kindergarten following the 1978 assessment. Twelve children completed five-year-old French immersion kindergarten and then entered an English grade one program in September of 1978. Six children were enroled in French immersion grade one and later transferred to the English program. Four children transferred in October, one in February and one in May.

Parents of 22 of these 25 children completed the section of the Parents' Questionnaire (Appendix 4) which pertains to the transfer from French immersion to the English program. The switch to English was suggested by school authorities for half of the children. All but two parents agreed with this suggestion. The reasons cited by the parents for the switch to English and the reasons for the school's suggestion that the child drop out of French immersion were classified in ten categories. For each child, a maximum of three responses was coded for the parents and two responses for the school authorities. The frequency of occurrence of the various reasons for switching to English are presented in Table 3.

Parents were primarily concerned with the child's emotional/social adjustment and general academic difficulties. School authorities were primarily concerned with the child's difficulties in comprehension and oral skills in the French language. It was determined that 17 children dropped out of French immersion because they encountered academic difficulties. Nonacademic reasons for the switch included the choice of private schools for Christian education (two children), and of schools closer to home (two children). One child had hearing and speech problems and another child was considered to be bored by the French immersion program. Two children were perceived to have undergone personality changes, becoming fearful or extremely active in the French immersion program and the parents chose to switch them to the English program.

Parents were asked to evaluate their child's progress in school to the Spring of the grade one program (Parents' Questionnaire, Appendix 4). Seventy-eight percent of parents of Drop-outs expressed satisfaction

TABLE 3

Frequency of Occurrence of Ten Reasons for Dropping Out of French Immersion as Cited by Parents and School Authorities

		Parents	School Authorities
1.	General academic difficulties.	6	2
2.	Social/emotional adjustment problems.	8	
3.	Parents moved, wanted child in neighbourhood school.	2	
4.	No possibility of help at home.	1	1
5.	Dissatisfaction with the quality of the French immersion program.	2	
6.	Dissatisfaction with a perceived lack of creativity and rigidity of the French immersion program.	1	
7.	Specific difficulty in reading in French.	1	1
8.	Specific difficulty in oral skills/comprehension of French.	3	5
9.	Visual or auditory discrimination problems, perceptual problems, coordination difficulties.	4	3
10.	Lack of concentration and motivation.	1	1

with their child's reading and spelling in the English program and 87% were satisfied with the development of social skills. Only 48% of parents of Drop-outs were satisfied with their child's general progress in the French immersion program compared to 77% who expressed satisfaction with their child's general progress in the English program. Only half of the Drop-outs were reported to have liked the French immersion program. In contrast, all but one child was reported to have liked the English program.

Of the 25 Drop-outs, 18 will advance to an English grade two in September of 1979. Five children will repeat the English grade one program. One child is suspected to have a learning disability and will enter a Special Education program. One child will be advanced to an English grade three.

French Immersion Group

The French immersion group was composed of 124 children who had attended a half-day five-year-old French immersion kindergarten and who continued in French immersion for the grade one program. Parents were asked to evaluate their child's progress in the Spring of 1979 and to indicate future educational plans (Parents' Questionnaire, Appendix 4). Parents of children in the French immersion group were generally satisfied with their child's progress in reading and spelling in French immersion (91%) and in the development of social skills (94%).

Parents of children in French immersion indicated that 120 of the 124 children will be advanced to French immersion grade two in September of 1979. Two children will repeat grade one. One child will remain in French immersion to repeat the program and the other child will switch to English to repeat grade one. One child will enter a Special Education program. One parent did not indicate the child's program for the 1979-80 school year.

English Group

Ten children were enroled in the English five-year-old kindergarten program in September of 1977 although their parents had previously intended to enrol them in French immersion. Parents reported that four of these ten children experienced difficulty in the English grade one program. One child had difficulty in the reading program; one child had difficulty concentrating and a short attention span; two children experienced social/ emotional adjustment problems. Four children in this group received special help in grade one. One child received speech therapy and three children attended remedial reading sessions. Despite these difficulties, all but one parent expressed satisfaction with their children's progress in reading and spelling and in developing social skills in the English grade one program.

Teachers also indicated the occurrence of difficulties and the need for special help for the children in the English group. Five-year-old kindergarten teachers reported that five of these ten children had experienced difficulty in school. Two children received special help during the kindergarten program. Teachers reported that six children experienced difficulty in the grade one program. The types of difficulty included difficulty in reading, difficulty concentrating, emotional/social adjustment problems, special learning problems (eg. perceptual, coordination), lack of motivation, difficulty in arithmetic and lack of confidence. Five children were given special help in grade one. One child received speech therapy, three children received remedial reading and two children received help in the area of social skills.

The difficulties reported by both parents and teachers for the children who did not enter the French immersion program even though their parents had initially intended to enrol them in French immersion, are of interest. It appears that prior to the beginning of the five-year-old kindergarten program, these parents reconsidered the advisability of the French immersion program for their children. As was reported previously (Trites and Price, 1979), parents of five of these children felt that their children were not ready for the French immersion kindergarten program. One parent was concerned that the child would not be able to receive help at home. Two parents objected to bussing. The other parents did not indicate reasons for changing their decision. The teachers' advice could have influenced some of the parents to change their decision since four-year-old kindergarten teachers had advised against French immersion enrolment for 40% of this group.

The four-year-old kindergarten teachers' ratings of the English group and their advice regarding French immersion enrolment were examined. All of the children who entered the English kindergarten program rather than French immersion were rated as Average or Above Average in terms of ability and motivation by their four-year-old kindergarten teachers. Three children were rated as Below Average in social maturation. As was suggested previously (Trites and Price, 1979), parents and teachers may pay particular attention to a young child's degree of social maturation when deciding upon a school program. Four-year-old kindergarten teachers advised against French immersion enrolment for four children in the English group. Later difficulties experienced by approximately half of the ten children suggest that the parents and teachers were alert to the possibility of later difficulties in school and opted for the regular English program to avoid the possibility of increased difficulties in a second language program.

The progress of the English group in the five-year-old kindergarten program was examined. At the end of the five-year-old kindergarten program, teachers rated seven of the ten children in the English group as ready for grade one. One child was rated as functioning at the early kindergarten level and two children were rated at the mid kindergarten level. The kindergarten teacher rated each child's comprehension of French and oral skills in French, usually in consultation with the core French teacher. The French language skills of these children varied. Three children were rated as Below Average in both comprehension and oral skills. Two children were rated as Average in comprehension and two were rated as Above Average. One child was rated as Average in oral skills and three children were rated as Above Average. The five-year-old kindergarten teachers advised against French immersion enrolment for six children in the English group (compared to four children at the four-year-old kindergarten level).

Teachers also assessed progress in the grade one program. The rating scale was completed by the English program teacher, usually in consultation with the core French teacher. At the end of grade one, four children were rated as ready for grade two. One child was rated at the early grade one level and five children were rated at the mid grade one level. In terms of comprehension of French, French oral skills and willingness and confidence in the French language, eight of the ten children were rated as Average for the core French program. One child was rated as Below Average in all areas and one child as Above Average in all. French reading is not taught in the core French program and these children were not rated in this area. Grade one teachers advised against French immersion enrolment for eight of the ten children in the English group. French immersion enrolment was advised for one child. This information was not available for the tenth child. The increasing tendency for teachers to advise against French immersion enrolment for the English group as they advance through school is likely partially a function of the lack of experience in the French language of these children. It becomes increasingly more difficult for the teachers to advise this program because they take into consideration that the child will be behind his peers in the program and will require assistance to catch up to the other children. However, grade one teachers were likely also attentive to the academic progress of these children. At the five-year-old kindergarten level, seven of the ten children were rated as ready for grade one, but at the grade one level, only four children were rated as ready for grade two. These ratings, together with the school difficulties reported for some of these children, indicate that there was a high incidence of academic problems in this group.

Parents indicated which school programs their children were expected to attend in September, 1979. Eight of the ten children presently enroled in the English grade one program will enter the English grade two program. One child will be transferred to a French immersion grade two. One child will be required to repeat grade one in the English program.

Bilingual Group

Five children were enroled in a bilingual grade one program. Three children had attended a bilingual kindergarten. Two children had attended a French immersion kindergarten.

Parents of these five children reported that none of the children had experienced difficulty in the bilingual grade one program and no child had required special help. All of these parents were satisfied with the progress of the children in learning to read and spell in both French and English and in the development of social skills.

Teachers also commented on the occurrence of difficulty or need for special help for the five children in the bilingual program. One child had experienced difficulty and received special help in the five-year-old kindergarten program. Two children had difficulty in grade one. Both children had poor oral French skills, one had difficulty reading and the other experienced emotional/social problems. None of the children received special help during the grade one program.

Four-year-old kindergarten teachers rated the five children in the bilingual program as Average or Above Average in social maturation and motivation. One child was rated as Below Average in ability. The other children were given Average ratings. Teachers advised French immersion enrolment for three of these children and advised against it for one child. This information was not available for the fifth child.

In terms of functioning level at the end of five-year-old kindergarten, one child in the bilingual program was rated at the mid kindergarten level and four children were rated as ready for grade two. Teachers' ratings of French language skills indicated that one child was Below Average in both comprehension and oral skills in French, two children were Average in both areas and two children were Above Average in both areas. Five-year-old kindergarten teachers advised French immersion enrolment for all five children in the bilingual program.

At the end of the bilingual grade one program, all five children were considered to be ready for grade two. Four children were rated as Above Average in French comprehension and oral skills. One child was rated as Average in both areas. With regard to the child's willingness and confidence in using the French language, one child was rated as Below Average, two children as Average and two children as Above Average. Children in the bilingual program received instruction in reading in French at the grade one level. One child was rated as Average in reading skills in French and four children were rated as Above average. These ratings indicate that the five children in this group have made good progress in the bilingual program. One teacher advised against French immersion enrolment for one child because it was felt that this child should continue in the bilingual program rather than switch to a new school and new friends. On the whole, the grade one teachers advised French immersion enrolment for children who did well in the bilingual program. These children have received intensive instruction in the French language and could make the transition to French immersion more easily than children who have been attending the English program.

Parents indicated the educational plans for September, 1979. Four children will advance to a bilingual grade two from the bilingual grade one program. One child will enter French immersion grade two from a bilingual grade one.

Descriptive Information Comparisons of the Four Grade One Enrolment Groups

Descriptive information including sex, hand dominance, age and family socioeconomic status (SES) are presented in Table 4 for the four grade one enrolment groups. Although there were more boys than girls in the English group, the chi-square analysis did not indicate significant sex differences. There was a fairly even distribution of males and females in each group. There were no significant group differences in age or in hand dominance, with the majority of children being right-handed. Significant group differences (one-way analysis of variance) were found in terms of the family's SES. SES was determined by assigning socioeconomic index numbers to the occupations of the parents (Blishen and McRoberts, 1976). Scheffé's multiple comparisons indicated that the French immersion and Drop-out groups were significantly higher in terms of family SES compared with children in the English program who had not attended French immersion and children in the Bilingual program.

TABLE 4

Sex, Hand Dominance, Age and Family SES Comparisons of the Four Grade One Enrolment Groups

	SEX				HAND DOMINANCE				AGE (years)		FAMILY SES	
	males		females		right		left					
	#	%	#	%	#	%	#	%	$\bar{X}$	ST	$\bar{X}^1$	SD
1) French immersion grade 1 (n=124)	56	45.2	68	54.8	113	91.1	11	8.9	6.89	0.28	62.3	10.8
2) English grade 1 (n=10)	8	80.0	2	20.0	7	70.0	3	30.0	7.03	0.21	51.5	16.5
3) Drop-outs (n=25)	13	52.0	12	48.0	23	92.0	2	8.0	6.96	0.27	62.0	11.0
4) Bilingual grade 1 (n=5)	2	40.0	3	60.0	5	10.0	0	0	6.76	0.32	57.3	7.6
statistical analysis	chi^2=4.79 (df=3)				chi^2=3.69 (df=3)				F ratio=0.170 (df=3,163)		F ratio=3.121* (df=3,155)	

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[1] Scheffé's multiple comparisons indicated that groups 1 and 3 had a significantly higher family SES than groups 2 and 4.

* $p < .05$

However, all of the children came from advantaged homes with the two lower SES groups falling in the upper middle class range and the two higher SES groups falling in the lower upper class range. This finding was consistent with the results of the Kindergarten Follow-up Assessment SES comparisons (Trites and Price, 1979).

Intelligence Test Scores of the Four Grade One Enrolment Groups

The four grade one enrolment groups differed significantly in terms of IQ as measured by the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) (Wechsler, 1963) administered in four-year-old kindergarten. Means, standard deviations and the results of a one-way analysis of variance of Full Scale IQ scores (FSIQ) are presented in Table 5. As can be seen from Table 5, the French immersion and Bilingual groups had significantly higher FSIQ scores than children in the English program, whether they had dropped out of French

TABLE 5

Means, Standard Deviations and *F* Ratio for FSIQ Comparisons of the Four Grade One Enrolment Groups

		(1) French immersion	(2) English	(3) Drop-outs	(4) Bilingual
FSIQ	X^1	120.7	109.5	114.6	123.6
	SD	11.5	7.6	11.8	16.6
Statistical analysis		*F* Ratio=4.74** (df=3,160)			

[1] Scheffé's multiple comparisons indicated significant differences between groups 1 and 4 versus groups 2 and 3 and between group 3 versus group 2.

** $p < .01$

immersion or had never been enroled in it. In addition, the Drop-outs had significantly higher FSIQ scores than the children who had never been in French immersion (English group). All groups had high IQ scores. The French immersion and Bilingual groups scored in the Superior range, the Drop-outs scored in the Bright-Normal range and the English group in the Average range. Although group differences were apparent, the children who were enroled in French immersion programs appear to be a highly competent, select group of children.

French Immersion Group Versus Drop-outs

Descriptive Information

The 124 children who were in French immersion grade one in the Spring of 1979 and the 25 children who had dropped out of French immersion and transferred to the English program were compared in terms of sex, hand dominance, age and family socioeconomic status in the comparisons of the four grade one enrolment groups previously presented in Table 4. As can be seen from this table, there were fairly equal representations of boys and girls in these two groups. The high proportion of right-handers in each group is comparable to the proportion of right-handers in the general population. There were no significant differences in age or in family SES with both groups falling within the lower upper class range. T-test analysis of the time in French immersion was significant ($t=17.56$, $df=21$, $p < .01$). The French immersion group had completed two years in the French immersion program while, on the average, the Drop-outs had spent approximately one year in the program.

Biographical and Background Information Questionnaire

Chi-square analyses were computed comparing the French immersion and Drop-out groups on data from the Biographical and Background Information Questionnaire (Appendix 5) completed in the first year of the *Assessment of Readiness for Primary French Immersion* (Trites and Price, 1978). There were no significant differences in terms of preschool attendance (64% of the French immersion group and 52% of the Drop-outs attended preschool), parents' attitudes towards learning and speaking French, parents' efforts to learn to speak French, advantaged home background as indicated by number of books in the home and reading to the child, or the child's exposure to the French language.

The results of a significant chi-square analysis of the number of siblings in French immersion are presented in Table 6. One-sample chi-square tests (Nie and Hall, 1977) were computed to determine group differences. Significantly fewer Drop-outs had siblings who were also enroled in French immersion programs. This information was gathered before the children in the present sample entered French immersion. Therefore, the siblings in the French immersion program were most likely older children in the family. Thus, the larger number of siblings in French immersion for the French immersion group may indicate a positive experience with the program, greater committment to the program, greater support for the younger children entering the program and a greater

TABLE 6

Chi-square Analysis Comparing the French Immersion Group and Drop-outs in terms of siblings enroled in French Immersion

	French immersion		Drop-outs			
	#	%	#	%	chi^2	df
Siblings enroled in French immersion?						
Yes	61	49.2	4	16.0	5.36*	1
No	63	50.8	21	84.0	4.20*	1
Statistical analysis	chi^2=8.02** (df=1)					

* $p < .05$

** $p < .01$

availability of help at home.

Parents' reasons for enroling their children in French immersion were classified in twelve categories. Up to three responses were coded for each case. Table 7 presents the frequency of occurrence of each reason for enrolment in French immersion cited by parents of the French immersion and Drop-out groups. The reason most frequently cited by parents of both groups was that French immersion was an opportunity to learn to speak French (#1 - 33%). The second most prevalent reason was the view that younger children learning a second language easily (#2 - 20%). Parents of both groups of children also frequently cited increased employment opportunities (#5 - 12%). On the whole, parents of both groups cited similar reasons for choosing the French immersion program. Parents of the French immersion group were more likely to cite the view that any second language is of value and contributes to a better education (#12) and parents of the Drop-outs were more likely to indicate the goal of communication enrichment (#10).

Gardner and Lambert (1959) described instrumental

TABLE 7

Frequency of Occurrence of Twelve Categories of Parents' Reasons for Enroling Children in French Immersion

Reason for Enrolment in French Immersion	French immersion #	French immersion %	Drop-outs #	Drop-outs %	Total #	Total %
1. Opportunity to learn to speak French, to have proficiency in two official Canadian languages.	69	32.1	16	34.8	85	32.6
2. Most painless and efficient way to teach a child a language, the younger the better for teaching a child to speak a new language comfortably and well.	43	20.0	9	19.6	52	19.9
3. Very positive attitude of child (interested, eager, enthusiastic).	5	2.3	1	2.2	6	2.3
4. Availability of program in local school (no English Kindergarten).	2	0.9	1	2.2	3	1.1
5. Increase future employment opportunities.	24	11.2	7	15.2	31	11.9
6. Increase understanding of other cultural groups.	17	7.9	3	6.5	20	7.7
7. Family is French Canadian or French is language of one parent.	--	---	--	---	--	---
8. Child enjoys school and is having no problems.	1	0.5			1	0.4
9. Program is a challenge and should help prevent boredom in the second kindergarten year.	8	3.7	1	2.2	9	3.4
10. Communication enrichment (all language skills will be improved).	4	1.9	4	8.7	8	3.1
11. Good experience with French immersion of siblings or friends.	8	3.7	1	2.2	9	3.4
12. General betterment of education (any second language is of value).	34	15.8	3	6.5	37	14.2

and integrative orientations toward second language learning. In the instrumental orientation, utilitarian or practical aspects of learning a second language are considered important, eg. enhanced career opportunities. In the integrative orientation, the aim of second language learning is to communicate with, or interact with, or to become in some way a part of the other language community. They found that high school students who had an integrative orientation tended to have greater success in second language learning than those with instrumental orientations. In the comparisons of parents reasons for enroling the French immersion group and Drop-outs in French immersion, both groups appeared to have a predominantly integrative orientation, with some consideration given to the instrumental goal of enhanced career opportunities. However, there were no differences in the parents' orientation towards second language learning which could be used to predict which children will drop out of French immersion.

Teachers' Advice re French Immersion Enrolment

At each level of assessment, teachers were asked to give their advice regarding the advisability of enrolment in French immersion for each child. At the four- and five-year-old kindergarten levels, teachers indicated whether French immersion was advised or not advised or that they were undecided. At the grade one level, teachers indicated that French immersion was advised, or advised "with reservations", or not advised. The results of chi-square analyses of the teachers' responses are presented in Table 8. Although four-year-old kindergarten teachers tended to advise against French immersion enrolment more frequently for Drop-outs compared to the French immersion group, this difference was not statistically significant. Four-year-old kindergarten teachers advised French immersion enrolment for approximately half of the Drop-outs. Thus, the advice of four-year-old kindergarten teachers does not indicate which children are likely to drop out of a primary French immersion program.

TABLE 8

Chi-square Analyses Comparing the French Immersion Group and Drop-outs in terms of Teachers' Advice re French immersion Enrolment

Teachers' advice re French immersion enrolment	French immersion #	French immersion %	Drop-outs #	Drop-outs %	One-sample chi^2 [1]
4-year-old kg teacher:					
advised	77	75.5	12	52.2	
not advised	21	20.6	10	43.5	
undecided	4	3.9	1	4.3	
statistical analysis	chi^2=5.41 (df=2)				
5-year-old kg teacher:					
advised	111	92.5	11	50.0	3.99*
not advised	8	6.7	11	50.0	25.33**
undecided	1	0.8	0	0	0.15
statistical analysis	chi^2=30.18** (df=2)				
grade one teacher:					
advised	94	75.8	1	4.0	16.91**
advised, with reservations	23	18.5	5	20.0	0
not advised	7	5.6	19	76.0	66.48**
statistical analysis	chi^2=75.87** (df=2)				

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[1] degrees of freedom=1 for each one-sample chi-square analysis.

* $p < .05$ ** $p < .01$

The chi-square analyses were significant for the responses of the five-year-old kindergarten and grade one teachers. One-sample chi-square tests were computed to determine group differences. Five-year-old kindergarten and grade one teachers advised against French immersion enrolment for a significantly greater proportion of Drop-outs compared to the French immersion group and they advised French immersion enrolment for significantly more children in the French immersion group. At the end of five-year-old kindergarten, teachers advised French immersion enrolment for half of the children who dropped out, however, by the end of grade one, teachers clearly advised French immersion enrolment for only one Drop-out and advised French immersion enrolment "with reservations" for five Drop-outs (20%). Five-year-old kindergarten teachers' advice was similar to the advice of four-year-old kindergarten teachers for the Drop-out group. Again, French immersion enrolment was advised for 50% of the Drop-outs, indicating that the five-year-old kindergarten teachers' advice does not indicate which children will drop out of French immersion. Grade one teachers were advising French immersion enrolment for children who had dropped out of the program and they were thus not predicting future progress. These teachers did advise French immersion enrolment for six Drop-outs. Their reservations about French immersion enrolment for these children were related to the need for remedial assistance, particularly in reading in French, in order to catch up to their peers in French immersion who had received a much greater amount of instruction in the French language.

At both the five-year-old kindergarten and grade one levels, teachers advised against French immersion enrolment for approximately 6% of the French immersion group. However, grade one teachers advised French immersion enrolment "with reservations" for 23 children in the French immersion group (19%). Thus, at the five-year-old kindergarten level, there were eight children who were viewed as being at risk for failure in the French immersion program. At the end of grade one French immersion, teachers identified 30 children as possible poor risks for continuation in the grade one French immersion program.

Grade one teachers' reservations about advising

French immersion enrolment for 23 children in French immersion grade one were classified in six categories. A maximum of three responses was recorded for each case. The frequency of occurrence of the six reservations are presented in Table 9 for the French immersion group. The most frequently cited reservation was that the child would require remedial assistance in reading in French. This was followed by concerns about the child's behavior including problems such as poor work habits, short attention span or poor response to discipline. Difficulties in French comprehension and French oral skills were also of concern.

Four-year-old kindergarten, five-year-old kindergarten and grade one teachers' reasons for advising French immersion enrolment were classified in ten categories. A maximum of three responses was recorded for each case. The frequency of occurrence of these ten reasons for advising French immersion enrolment for the French immersion group and Drop-outs are presented in Table 10. At all grade levels, teachers

TABLE 9

Frequency of Occurrence of Grade One Teachers' Reservations about French Immersion Enrolment for the French Immersion Group

Grade One Teachers' Reservations	Frequency
1. Child requires remedial assistance in reading in French.	11
2. Difficulties in comprehension of French.	5
3. Difficulties in French oral skills.	5
4. Lacks self-confidence or willingness to use the French language.	4
5. Discipline and/or behavior problem; short attention span; poor work habits.	7
6. Unspecified need for remedial assistance.	3

TABLE 10

Frequency of Occurrence of Ten Categories of Reasons Cited by Teachers for Advising French Immersion Enrolment for the French Immersion Group and Drop-outs

	four-year-old kg teacher		five-year-old kg teacher		grade one teacher	
	French immersion	drop-outs	French immersion	drop-outs	French immersion	drop-outs
1. Generally supportive home situation.	2	1	2			
2. Emotional/social adjustment (outgoing, confident, handles stress well).	13	2	3		4	
3. Good tolerance (persistent).			1	1		
4. Maturity (works independently, desire to learn).	18	1	18	1		
5. Average to high ability, absence of any special problems.	29	3	51	4	47	1
6. Well developed language skills.	18	2	21	1	3	
7. Able to concentrate, good listening skills.	9				1	
8. Content, happy in present program.			4		4	
9. Good attitude toward learning.			38	5	26	
10. Good comprehension and oral skills in French.					45	1

tended to cite average to high ability and absence of any special problems most frequently when advising French immersion enrolment. At the grade one level, good comprehension of French and good oral skills in French were viewed as important for continuing in French immersion. As the child advanced in school, a good attitude toward learning was given as a reason for advising French immersion enrolment. Four-year-old and five-year-old kindergarten teachers considered maturity and well developed language skills to be of great importance when advising French immersion enrolment.

Four-year-old kindergarten, five-year-old kindergarten and grade one teachers' reasons for advising against French immersion enrolment were classified in 11 categories. A maximum of three responses was recorded for each case. The frequency of occurrence of these 11 reasons for advising against French immersion enrolment are presented in Table 11 for the French immersion group and Drop-outs. At the four-year-old kindergarten level, teachers considered poor emotional-social adjustment and immaturity most frequently when advising against French

TABLE 11

Frequency of Occurrence of Eleven Categories of Reasons Cited by Teachers for Advising Against French Immersion Enrolment for the French Immersion Group and Drop-outs

	four-year-old kg teacher		five-year-old kg teacher		grade one teacher	
	French immersion	drop-outs	French immersion	drop-outs	French immersion	drop-outs
1. Poor emotional/social adjustment (needs security, not participating, lacks confidence).	12	3	1			
2. Poor tolerance (easily frustrated, gives up easily, poor response to stress and challenge).	1	1	1	1		1
3. Immaturity (poor self-motivation).	8	4	3	2	3	2
4. Below average ability.	5		5	2	3	2
5. Poorly developed language skills (not able to cope in English, speech problems).	5	5	2	1		1
6. Short attention span (poor auditory skills, poor application).	3	1	1	2	4	
7. Physical or medical problems.	1		1			
8. No French immersion available.				1		
9. Poor attitude toward learning.			1	3		1
10. Difficulties in the home situation.	1					
11. Poor comprehension of French, poor oral skills in French					2	3

immersion enrolment. Below average ability and poorly developed language skills were cited less frequently by four-year-old kindergarten teachers but were also considered to be of importance. Five-year-old kindergarten teachers were most sensitive to below average ability followed by immaturity and a poor attitude toward learning. Grade one teachers advised against French immersion when children had a short attention span, were immature, had below average ability or poor comprehension of French and poor French oral skills.

Four-year-old Kindergarten Teachers' Ratings

The French immersion group and Drop-outs were compared in terms of four-year-old kindergarten teachers' ratings of ability, social maturation and motivation. Chi-square analyses of these ratings are presented in Table 12. There were no significant differences between the groups on these ratings. Very few children were rated as Below Average in ability or motivation. The

TABLE 12

Chi-square Analyses Comparing the French Immersion Group and Drop-outs in terms of Four-year-old Kindergarten Teachers' Ratings of Ability, Social Maturation and Motivation

	French immersion		Drop-outs	
	#	%	#	%
ABILITY				
Below Average	2	1.6	2	8.0
Average	56	45.5	13	52.0
Above Average	65	52.8	10	40.0
statistical analysis	chi^2=3.98	(df=2)		
SOCIAL MATURATION				
Below Average	25	20.3	3	12.0
Average	69	56.1	19	76.0
Above Average	29	23.6	3	12.0
statistical analysis	chi^2=3.43	(df=2)		
MOTIVATION				
Below Average	6	4.9	2	8.0
Average	79	64.8	18	72.0
Above Average	37	30.3	5	20.0
statistical analysis	chi^2=1.30	(df=2)		

French immersion group and Drop-outs did not differ in terms of ability, social maturation and motivation at the four-year-old kindergarten level with the majority of children rated as Average or Above Average. Thus, one can not predict which children are likely to drop out of a primary French immersion program on the basis of four-year-old kindergarten teachers' ratings on these scales.

Five-year-old Kindergarten Teachers' Ratings

Five-year-old kindergarten teachers rated the French immersion group and Drop-outs in terms of their functioning levels in the Spring of five-year-old kindergarten, their comprehension of French and oral skills in French. The results of chi-square analyses of these ratings are presented in Table 13. The chi-square analysis of functioning level was not significant. It is interesting to note that even in May and June of the school year, only 66% of the French

TABLE 13

Chi-square Analyses Comparing the French Immersion Group and Drop-outs in terms of Five-year-old Kindergarten Teachers' Ratings of Functioning Level, Comprehension of French and French Oral Skills

	French immersion		Drop-outs		One-sample[1] chi^2
	#	%	#	%	
Functioning Level					
Early Kindergarten	7	5.7	0	0	
Mid Kindergarten	34	27.9	10	45.5	
Ready for Grade 1	81	66.4	12	54.5	
statistical analysis	chi^2=3.55 (df=2)				
Comprehension of French					
Below Average	11	9.0	6	31.6	9.07**
Average	62	50.8	10	52.6	0
Above Average	49	40.2	3	15.8	2.64
statistical analysis	chi^2=9.60** (df=2)				
French Oral Skills					
Below Average	14	11.5	9	47.4	13.80**
Average	63	51.6	7	36.8	0.51
Above Average	45	36.9	3	15.8	1.71
statistical analysis	chi^2=15.86** (df=2)				

[1] degrees of freedom=1 for each one-sample chi^2 test.

** $p < .01$

immersion group and 55% of the Drop-outs were rated as ready for grade one. Six per cent of the French immersion group were rated at the early kindergarten level. This suggests that some children have encountered severe difficulty in the French immersion kindergarten program. Another 34% of the French immersion group were rated at the mid kindergarten level indicating a group of children progressing more slowly than desirable in this program. Among the Drop-outs, approximately half of the children were performing below expected levels at the end of the kindergarten program. Five Drop-outs had transferred to English during the kindergarten program and the ratings represent progress in both French immersion and English kindergarten. However, the ratings do suggest that some of these children have encountered difficulty in the kindergarten program, but the incidence of difficulty does not differ significantly from that of the French immersion group.

There were significant chi-square differences in terms of the comprehension of French and oral skills in French. One-sample chi-square tests were computed to determine group differences. For both French comprehension and oral skills, significantly more Drop-outs were rated as

Below Average compared to the French immersion group. Some of the Drop-outs were rated in reference to children in the core French program. The greater proportion of Below Average ratings for the Drop-outs suggests that a greater proportion of children in this group have experienced difficulty in acquiring French language skills.

Grade One Teachers' Ratings

At the grade one level, the Drop-outs were rated in terms of their French language skills in comparison with other children in the core French program. Thus, the teachers who rated the French immersion group and the Drop-outs had a point of reference for evaluating the children. The results are presented for descriptive purposes. The results of the chi-square analyses of grade one teachers' ratings of overall functioning level, comprehension of French, oral skills in French, reading skills in French and confidence and willingness in the French language are presented in Table 14. The chi-square

TABLE 14

Chi-square Analyses Comparing the French Immersion Group and Drop-outs in terms of Grade One Teachers' Ratings of Functioning Level, Comprehension of French, French Oral Skills, French Reading Skills and Confidence in French

	French immersion #	%	Drop-outs #	%	One-sample[1] chi^2
Present Functioning Level					
Early grade 1	2	1.6	4	23.5	10.80**
Mid grade 1	22	17.7	5	29.4	1.50
Ready for grade 2	100	80.6	8	47.1	2.18
statistical analysis	chi^2=20.14** (df=2)				
Comprehension of French					
Below Average	4	3.2	4	18.2	10.29**
Average	73	58.9	13	59.1	0
Above Average	47	37.9	5	22.7	1.33
statistical analysis	chi^2=8.84* (df=2)				
French Oral Skills					
Below Average	5	4.0	4	18.2	10.13**
Average	84	67.7	14	63.6	0.08
Above Average	35	28.2	4	18.2	0.79
statistical analysis	chi^2=6.82* (df=2)				
Reading Skills in French					
Below Average	8	6.5	3	37.5	2.40
Average	72	58.1	3	37.5	0.86
Above Average	44	35.5	2	25.0	0.43
statistical analysis	chi^2=9.49** (df=2)				
Confidence and Willingness in French					
Below Average	7	5.6	3	14.3	
Average	78	62.9	14	66.7	
Above Average	39	31.5	4	19.0	
statistical analysis	chi^2=2.92 (df=2)				

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[1] degrees of freedom=1 for each one-sample chi-square test.

* $p < .05$

** $p < .01$

analyses were significant for each category. One-sample chi-square tests were computed to further delineate group differences. However, one must note that the teachers rated the two groups in relation to different criteria for French language skills. The Drop-outs received a significantly greater proportion of Below Average ratings of French comprehension and French oral skills. Most children in the French immersion group were rated as Average or Above Average in all categories.

In terms of overall functioning level, there were greater group differences than were observed at the end of five-year-old kindergarten. However, this rating was available for only 17 of the 25 Drop-outs. Significantly more Drop-outs were rated at the early grade one level. Only 47% of the Drop-outs were rated as ready for grade two, compared to 81% of the French immersion group (versus 66% and 55%, respectively, rated as ready for grade one at the end of five-year-old kindergarten). These ratings suggest that the Drop-outs who encountered difficulty in five-year-old kindergarten and were progressing at the mid kindergarten level in the Spring of 1978, have also encountered difficulty in grade one. Four of these children were at the early grade one level in the Spring of 1979. Of the 25 Drop-outs, six transferred to English during the grade one program and had not completed the full grade one program in English, 12 children entered English grade one following French immersion five-year-old kindergarten and seven children transferred to English during the kindergarten year. The high proportion of performance levels below expectation at the grade one level may indicate that the time spent in French immersion has held back progress in the English program. Five Drop-outs will repeat the English grade one program.

The number of children encountering severe difficulty in the French immersion program has decreased during the grade one program (2%) compared to the five-year-old kindergarten program (6%). There has also been a decrease in the number of children progressing more slowly than the majority (28% in five-year-old kindergarten versus 18% in grade one). Although grade one teachers rated 81% of the French immersion group as ready for grade two, they advised French immersion enrolment without reservations for only 76% of this group (see Table 8).

Difficulty and Special Help in School

Five-year-old kindergarten and grade one teachers indicated the number of children who encountered difficulty and the number who received special help at these two levels. Chi-square analyses of teachers' responses for the French immersion group and the Drop-outs are presented in Table 15. The chi-square analyses were significant at the kindergarten level. One-sample chi-square tests indicated that significantly more Drop-outs encountered difficulty in kindergarten and that significantly more Drop-outs received special help in kindergarten compared to the French immersion group. Thus, encountering difficulty and receiving special help in French immersion five-year-old kindergarten are indications that a child may drop out of the French immersion program. However, 35-40% of Drop-outs did not have such difficulties. In addition, 32% of the French immersion group encountered difficulty in kindergarten and 23% continued in the French immersion program although they had received special help.

TABLE 15

Chi-square Analyses Comparing the French Immersion Group and Drop-outs in terms of Teachers' Reports of Difficulty and Special Help in School

	French immersion		Drop-outs		One-sample[1]
	#	%	#	%	chi^2
Difficulty in five-year-old kindergarten?					
yes	39	32.0	15	65.2	4.80*
no	83	68.0	8	34.8	3.04
statistical analysis	chi^2=7.79** (df=1)				
Special help in five-year-old kindergarten?					
yes	28	23.1	13	56.5	9.23**
no	93	76.9	10	43.5	3.30
statistical analysis	chi^2=8.99** (df=1)				
Difficulty in grade one?					
yes	43	34.7	13	52.0	
no	81	65.3	12	48.0	
statistical analysis	chi^2=1.97 (df=1)				
Special help in grade one?					
yes	30	24.4	11	44.0	
no	93	75.6	14	56.0	
statistical analysis	chi^2=3.07 (df=1)				

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[1] degrees of freedom=1 for each one-sample chi-square test.

* $p < .05$

** $p < .01$

At the grade one level, although not significant, the trend observed was similar to that at the kindergarten level with a greater proportion of Drop-outs encountering difficulty and receiving special help. Again, these teachers' ratings indicated that many children continuing in the French immersion grade one program were encountering difficulty (35%) and required special help (24%).

The reasons for difficulty in the five-year-old kindergarten and grade one programs were classified in 12 categories. A maximum of three responses was coded for each case. The frequency of occurrence of the 12 reasons for difficulty in school are presented in Table 16 for the French immersion group and Drop-outs. For the French immersion group, the most frequent difficulties at the kindergarten level were immaturity and emotional or social adjustment problems. In contrast, the Drop-outs most frequently encountered difficulties in the French language and auditory areas. At the grade one level, teachers cited reading difficulties most frequently for both groups.

TABLE 16

Frequency of Occurrence of Twelve Categories of Reasons for Difficulty in Five-year-old Kindergarten and Grade One for the French Immersion Group and Drop-outs

	Five-year-old kg teacher		Grade one teacher	
	French immersion	Drop-outs	French immersion	Drop-outs
1. Below average ability.	2			
2. Language difficulties, poor oral French.	6	5	9	3
3. Auditory difficulties.	1	3		
4. Immature.	10	2	1	2
5. Poor concentration, short attention span.	7	3	3	2
6. Emotional or social adjustment problems.	9		7	2
7. Not motivated.	1	2	3	
8. Medical or physical problems.		1	3	
9. Special learning problem (perceptual, coordination, etc.).	8	2	8	2
10. Reading difficulty.			19	7
11. Difficulty in arithmetic.			3	
12. Lacking confidence.			5	1

The types of special help received by Drop-outs and the French immersion group at the five-year-old kindergarten and grade one levels are presented in Table 17. At the kindergarten level, the most frequent special help given to each group was in the area of social skills. At the grade one level, remedial reading and phonics training were most frequently given. Thus, in terms of the reasons for difficulties reported by teachers and the types of special help given, there was a tendency to switch from an emphasis on social development at the kindergarten level to an emphasis on academic skills at the grade one level.

Early Identification Assessment Battery

T-tests were computed comparing the French immersion group and the Drop-outs on the measures of the Early Identification Assessment Battery administered in four-year-old kindergarten (see Appendix 8). Means, standard deviations and the results of significant t-test comparisons are presented in Table 18. The French immersion

TABLE 17

Frequency of Occurrence of
Eight Categories of Special Help Received
in Kindergarten and Grade One by the
French Immersion Group and Drop-outs

	Five-year-old kg teacher		Grade one teacher	
	French immersion	Drop-outs	French immersion	Drop-outs
1. Speech training, speech therapy.	4	2	1	1
2. Auditory discrimination, oral comprehension.	4	1	8	2
3. Written work.	2	1	2	1
4. Basic skills - word, letter, color discrimination.	3		1	
5. Phonics training, remedial reading.			15	6
6. Spatial relationships.	3		1	
7. Social skills (maturity, self-confidence).	16	9	3	2
8. Behavior management (discipline, time on task, attention span exercises).	2	2	2	2

group had significantly higher IQ scores, higher scores on readiness measures, better performance in terms of manipulating the speech signal (word segmenting), better expressive language skills (Renfrew Action Picture Test, Information), better performance with the dominant hand on the Tactual Performance Test, and better ratings of manual dexterity and auditory comprehension. The French immersion group appeared to be brighter, although the IQ scores of the Drop-outs were within the Bright Normal range. The French immersion group was generally better prepared for the five-year-old kindergarten program. However, they did not differ in terms of English receptive vocabulary skills or in behavior ratings.

In view of the significant IQ differences between the French immersion group and Drop-outs, analyses of covariance with WPPSI Full Scale IQ (FSIQ) as the covariate were calculated to determine group differences distinct from IQ differences. Analyses of covariance of the Tactual Performance Test scores from the Early Identification Assessment Battery (three block board) yielded significant effects of group membership for the

TABLE 18

Means, Standard Deviations and Significant t-test Comparisons of the French Immersion Group and Drop-outs on the Early Identification Assessment Battery

	French immersion $\bar{X}$	SD	Drop-outs $\bar{X}$	SD	t-prob
	n=124		n=25		
WPPSI:					
VIQ	120.6	11.7	114.5	12.8	.035
PIQ	116.9	12.0	111.6	12.0	.050
FSIQ	120.7	11.5	114.6	11.8	.022
Vocabulary	13.6	2.5	12.2	2.5	.020
Arithmetic	13.1	2.5	11.8	1.9	.002
Sentences	10.7	2.7	8.9	3.3	.016
Picture Completion	13.2	2.5	11.9	2.7	.035
WRAT:					
reading grade	1.1	0.4	0.9	0.3	.004
arithmetic grade	0.9	0.4	0.6	0.4	.000
Colour-naming	9.4	1.0	8.9	2.2	.050
Word segmenting:					
total	13.8	4.0	10.7	6.3	.002
syllables	9.6	3.7	7.1	4.6	.018
Observer's Checklist:					
C: Manual dexterity	5.4	1.4	4.7	1.2	.024
Renfrew:					
Information	25.7	3.4	23.6	3.5	.011
Myklebust:					
auditory comprehension	13.5	2.8	12.3	2.1	.019
verbal	29.9	5.4	27.7	4.9	.044
Total	77.7	12.4	73.0	9.1	.032
CIRCUS:					
2: How much & how many	32.1	4.2	28.3	4.7	.001
5: Finding letters and numbers	17.7	2.4	16.0	3.7	.004
7: How words sound	40.4	2.8	37.7	3.6	.001
9: Listen to the story	18.0	3.1	15.7	3.7	.005
13: Think it through	21.5	4.4	18.9	4.5	.013
Tactual Performance Test:					
Dominant time per block	32.8	0.8	33.6	3.0	.020

time per block measure with the dominant hand. The effect of IQ was not significant. The French immersion group performed significantly better than the Drop-outs on the measure.

The results of the analyses of covariance of other measures from the Early Identification Assessment Battery indicated that when the effects of IQ were controlled, the effect of group membership was significant for WRAT spelling scores, observers' rating of amount of motor activity, and the CIRCUS readiness measures of quantitative concepts (#2), knowledge of numbers and letters (#5), auditory discrimination (#7), and listening comprehension (#9).

These results indicate important differences between Drop-outs and the French immersion group in terms of performance on the Tactual Performance Test and general readiness, particularly in terms of listening skills related to auditory discrimination and comprehension.

Kindergarten Follow-up Assessment Battery

Means, standard deviations and the results of significant t-test comparisons of the Drop-outs and French immersion group on the measures of the Kindergarten Follow-up Assessment Battery (see Appendix 9) are presented in Table 19. The French immersion group obtained higher scores on all measures where significant group differences were found. The French immersion group had better listening comprehension in French and English, better receptive vocabulary skills in English, better English grammar scores, higher academic achievement in reading and arithmetic, and better ratings of performance rate and manual dexterity. Again, there were no differences in terms of the teachers' ratings of behavior problems. Drop-outs were not significantly behind the French immersion group in the knowledge of letters and numbers in French, English spelling, tactual performance or manipulation of the speech signal.

Analyses of covariance with WPPSI Full Scale IQ (FSIQ) as the covariate were calculated for measures

TABLE 19

Means, Standard Deviations and Significant t-test Comparisons of the French Immersion Group and Drop-outs on the Kindergarten Follow-up Assessment Battery

	French immersion		Drop-outs		
	$\bar{X}$	SD	$\bar{X}$	SD	t-pro
FRENCH COMPREHENSION TEST:					
raw	26.3	7.1	23.7	5.4	.059
percentile	53.7	26.7	42.5	22.1	.049
PEABODY (Form B):					
receptive: M-A	7.4	1.3	6.9	1.1	.039
IQ	117.4	14.3	111.0	13.4	.039
RENFREW:					
information	24.9	3.7	22.7	4.1	.017
Picture-naming (errors):	91.7	3.3	89.1	3.5	.004
WRAT:					
reading %ile	74.5	17.1	62.5	22.6	.019
arithmetic %ile	77.1	16.4	58.8	21.2	.000
arithmetic grade	1.6	0.5	1.2	0.4	.000
CIRCUS:					
9: Listen to the story	21.2	2.7	19.3	2.6	.002
OBSERVER'S CHECKLIST:					
B: Performance rate	5.3	1.7	4.3	1.1	.006
C: Manual dexterity	5.5	1.5	4.7	0.9	.009

of the Kindergarten Follow-up Assessment Battery to determine group differences distinct from IQ differences. The results of these analyses indicated that with IQ controlled statistically, the effect of group membership was significant for expressive language skills in English (Renfrew Information) and in French (picture-naming in French), for the WRAT arithmetic grade level and percentile, and listening skills in English (CIRCUS #9). Only the effect of IQ was significant for the French Comprehension Test. Thus, the Drop-outs were not deficient in the development of English reading and spelling or French comprehension, but they did lag behind the French immersion group in expressive language skills in both English and French and in listening comprehension in English.

Grade One Follow-up Assessment Battery

Means, standard deviations and the results of significant t-test comparisons of the Drop-outs and French immersion group on the measures obtained at the end of grade one are presented in Table 20. As might be expected, the French immersion group outperformed the Drop-outs on all measures of French language achievement. The French immersion group were also more cooperative and interested during the assessment and had higher English grammar scores. However, the Drop-outs had significantly higher scores in English spelling and there were no longer significant group differences in reading and arithmetic in English. Thus, children who dropped out of French immersion had accelerated in all areas of academic achievement in English compared to children who continued in the French immersion program.

At the grade one level, analyses of covariance with FSIQ as the covariate indicated that the main effects of FSIQ and the effects of group membership were significant for all of the French language measures including the French Comprehension Test (Level One), the Test de Rendement en Francais (Level One), the French version of the Peabody Picture Vocabulary Test, knowledge of the alphabet and numbers in French, and picture-naming in French (errors). The effect of IQ was not significant

TABLE 20

Means, Standard Deviations and Significant t-test Comparisons of the French Immersion Group and Drop-outs on the Grade One Follow-up Assessment Battery

	French immersion Grade 1		Drop-outs Transfers		
	$\bar{X}$	SD	$\bar{X}$	SD	t-prob
French Comprehension Test:					
raw	30.9	6.2	13.0	5.3	.000
%ile	61.1	28.3	4.8	13.4	.000
WRAT:					
spelling grade	1.8	0.7	2.2	0.7	.027
Renfrew:					
grammar	32.4	3.1	30.4	6.8	.022
French Peabody:					
M-A	5.1	1.7	3.0	0.8	.000
IQ	78.0	19.7	58.3	5.5	.000
Alphabet (French)	12.5	0.6	10.8	1.8	.000
Numbers (French)	12.1	1.8	4.1	4.1	.000
French Picture Naming:					
time	949.1	17.8	905.4	167.7	.000
errors	95.2	2.8	84.3	15.9	.000
Rendement:					
raw	13.4	3.4	6.7	3.1	.000
stanine	2.7	1.0	1.3	0.6	.000
Observer's Checklist:					
I: cooperation	6.4	1.2	5.7	1.4	.013
J: interest	6.2	1.3	5.6	1.1	.019

for the time score for picture-naming in French, but the effect of group membership was significant for this measure. The effects of both IQ and group membership were also significant for WRAT measures of achievement in English reading and spelling, and teachers' rating of tension-anxiety. With regard to reading and spelling, the Drop-outs achieved higher grade scores on the WRAT than the French immersion group. The Drop-outs scored at the 2.8 grade level in reading and at the 2.2 grade level in spelling compared to 2.3 and 1.8, respectively, for the French immersion group. Thus, the Drop-outs have made better progress in reading and spelling in English than children who continued in French immersion to the end of grade one and who have not received formal instruction in English reading and spelling. The Drop-outs were also less tense and anxious than the French immersion group. The analyses of covariance also yielded a significant effect of group membership for the teachers' rating of conduct problems and the observers' rating of effort. The Drop-outs were reported to have more conduct problems and to have put forth less effort during the testing situation.

Discussion of Comparisons of Drop-outs and the French Immersion Group

The 124 children who attended the French immersion program to the end of the grade one year and the 25 children who dropped out of French immersion were similar in terms of family socioeconomic status (lower upper class range), sex (fairly equal distributions of boys and girls), handedness (90% were right-handed) and preschool experience. Both groups were from advantaged home backgrounds. Parents of both groups expressed a predominantly integrative orientation in terms of their reasons for enroling their children in French immersion. Parents' attitudes towards the French language and its speakers were positive. The only significant difference between the Drop-outs and the French immersion group in terms of biographical and background information was that the French immersion group had more older siblings enroled in the French immersion program. This may be an indication that the families of the children in the French immersion group have had a positive experience with the

French immersion program, are possibly more committed to the program, and are able to offer greater support and more help in the French language to younger children entering the program.

The reliability of four-year-old and five-year-old kindergarten teachers' recommendations with regard to French immersion enrolment as predictors of which children will drop out of the program was examined. The importance of this question was evident in the previous assessments (Trites and Price, 1978, 1979) which indicated that teachers follow informal criteria in either recommending or not recommending French immersion enrolment. At the four-year-old kindergarten level, there were no significant differences between the French immersion group and Drop-outs in terms of the teachers' advice regarding the advisability of French immersion enrolment. At the five-year-old kindergarten level, teachers advised French immersion significantly more often for the French immersion group; however, they continued to advise French immersion enrolment for half of the Drop-outs, as had the four-year-old kindergarten teachers. Thus, the advice of the four-year-old kindergarten and five-year-old kindergarten teachers does not reliably predict which children will drop out of the French immersion program.

Four-year-old kindergarten teachers rated the children in terms of ability, social maturation and motivation prior to their enrolment in French immersion five-year-old kindergarten. The French immersion and Drop-out groups did not differ significantly on these scales. Thus, one can not predict which children are likely to drop out of a primary French immersion program on the basis of these ratings by four-year-old kindergarten teachers. The children who entered the French immersion five-year-old kindergarten program, whether they dropped out or continued in the program, tended to be able pupils with average to above average ratings of ability and motivation.

In the Spring of five-year-old kindergarten, significantly more Drop-outs were rated as Below Average in both the comprehension of French and French oral skills, suggesting that a greater proportion of Drop-outs, compared to the French immersion group, had experienced difficulty in acquiring French language skills. However, in terms of overall functioning level at the end of five-year-old kindergarten, there were no significant differences between the Drop-outs and the French immersion group. Only 66% of the French immersion group and 55% of the Drop-outs were rated as ready for grade one. Five of the Drop-outs were rated in terms of their functioning level in the English kindergarten program which confuses comparisons of these groups in terms of general progress in French immersion kindergarten. However, the ratings by the five-year-old kindergarten teachers suggest that similar proportions of Drop-outs and the French immersion group were progressing slowly in five-year-old kindergarten.

In the Spring of grade one, teachers' ratings of overall functioning level indicated greater group differences than were observed at the end of five-year-old kindergarten. Approximately half of the Drop-outs were rated as ready for the next grade at the end of five-year-old kindergarten and at the end of grade one. In contrast, 81% of the French immersion group were rated as ready for grade two compared to only 66% rated as ready for grade one at the end of five-year-old kindergarten. Teachers rated only 17 of the 25 Drop-outs on this variable and this information is thus incomplete. It suggests that the children who continued in the French immersion program experienced less difficulty in grade one than the children who dropped out of French immersion and entered the English program. For the Drop-outs, grade one teachers rated their functioning level in the English grade one program. The time spent in French immersion may have held back the progress of the Drop-outs in the English program.

The five-year-old kindergarten and grade one teachers' reports of difficulty and special help in school indicated that the Drop-outs encountered significantly more difficulty and received significantly more special help in kindergarten, but not in grade one. This indicates that the Drop-outs are improving in terms of difficulty in school and suggests that they are adjusting to the English program. Approximately one third of children in the French immersion group encountered difficulties in kindergarten and in grade one. Encountering difficulty and receiving special help in five-year-old kindergarten are indications that a child may drop out of the French immersion program. However, 35-40% of Drop-outs did not have such difficulties while 32% of the French immersion group encountered difficulty in kindergarten and 23% continued in the French immersion program although they received special help.

The comparisons of the French immersion group and Drop-outs on the Early Identification Assessment Battery indicated that the French immersion group had higher IQ scores. However, the Drop-outs were within the Bright Normal range on intelligence and are capable of good progress in school. Although the French immersion group had higher scores on the WRAT reading and arithmetic measures, both groups scored at least six months above the four-year-old kindergarten level. With regard to CIRCUS readiness measures, the French immersion group outperformed the Drop-outs and were better prepared for the five-year-old kindergarten program. When IQ differences were controlled statistically in analyses of covariance, the Drop-outs continued to differ significantly from the French immersion group on CIRCUS readiness measures. However, the Drop-outs were not deficient in terms of readiness skills and were well able to cope with the demands of a regular kindergarten program. The poorer performance of the Drop-outs on readiness measures reflecting language skills, namely listening comprehension and auditory discrimination, suggest that children with better English language skills in four-year-old kindergarten were less likely to drop out of French immersion.

The significantly better performance of the French immersion group on the Tactual Performance Test (dominant hand time per block), even when Full Scale IQ was controlled statistically, is consistent with the findings of previous investigations of children encountering difficulty in French immersion and of Drop-outs from the French immersion program (Trites and Price, 1976, 1977). Again, the Drop-outs performed more poorly on this measure in contrast to children in the French immersion program. This finding is consistent with the maturational lag hypothesis proposed in the earlier studies.

At the five-year-old kindergarten level, the French immersion group had better expressive language skills in English and French, better listening comprehension in English and better arithmetic scores when IQ was controlled statistically. The Drop-outs were not deficient in French Comprehension Test scores when IQ differences were controlled.

The Drop-outs lagged behind the French immersion group in all areas of achievement in French assessed in grade one. These differences were evident when IQ was controlled and could be expected since the French immersion group have had approximately one year of additional instruction in the French language compared to the Drop-outs.

At the grade one level, the French immersion group and Drop-outs differed in terms of reading and spelling skills in English and behavior ratings when IQ was controlled statistically. The Drop-outs outperformed children who continued in French immersion on WRAT measures of reading and spelling. Thus, the Drop-outs have responded well to instruction in the English language and are making progress. The Drop-outs had a greater incidence of conduct problems, put forth less effort and were less tense and anxious than the French immersion group.

Comparison of Drop-outs versus Low Achievers and High Achievers in French Immersion

As was noted in the description of the Drop-out group, eight children dropped out of French immersion for nonacademic reasons. The remaining 17 Drop-outs had encountered academic difficulties in the French immersion program. These 17 Drop-outs were compared extensively to Low achievers and High achievers in the grade one French immersion program. Low achievers were defined as the group of children who obtained a score at or below the 25th percentile on the French Comprehension Test, Level One, based upon the norms presented in the Teacher's Manual (Barik, 1976), together with Average or Below Average ratings of French comprehension and oral skills in French from their grade one teachers. High achievers were defined as the group of children who obtained a score at or above the 75th percentile on the French Comprehension Test, Level One, together with grade one teachers' ratings of Above Average in terms of both French comprehension and oral skills. The grade one teachers' ratings of French comprehension and French oral skills for children scoring at or below the 25th percentile on the French Comprehension Test, Level one, and for children scoring at or above the 75th percentile are presented in Table 21. Eighteen children had scores at or below the 25th percentile which corresponds to raw scores below 25. Forty-seven children scored at or above the 75th percentile corresponding to raw scores above 33. For the present sample of 124 children completing French immersion grade one, the percentile ranks differed only slightly from these norms. The lowest quarter (n=31) had raw scores of 27 and below and the highest quarter (n=31) scored 36 or higher (versus 25 and 33, respectively). Using the norms provided by the Teacher's Manual, 17 children met the criteria for Low achievers and 22 children met the criteria for High achievers. Twenty-five children who scored above the 75th percentile on the French Comprehension Test were excluded from the group of High achievers because their teachers had not rated them as Above Average in both French comprehension and French oral skills.

TABLE 21

Grade One Teachers' Ratings of French Comprehension and French Oral Skills for Groups Formed on the basis of Percentile Ranks on the French Comprehension Test, Level One

	French Comprehension Test (Level One) Percentile Rank					
	≤ 25th percentile			≥ 75th percentile		
	French Comprehension			French Comprehension		
	below average	average	above average	below average	average	above average
FRENCH ORAL SKILLS						
below average	1	1	0	0	0	0
average	0	15	0	0	15	8
above average	0	0	1	0	2	22

Descriptive Information

Descriptive information including sex, handedness, and family socioeconomic status (SES) are presented in Table 22. Chi-square analyses indicated that there were no significant differences in terms of sex or handedness. However, there was a tendency towards a higher representation of girls among the High achievers. Most children were right-handed but there was an interesting, although nonsignificant, trend towards a higher representation of left-handed children among the Low achievers in French immersion. Previous studies (Trites and Price, 1976, 1977) found an unusually high representation of left-handed children among groups of children who dropped out of French immersion programs.

One-way analyses of variance did not yield significant differences in terms of SES. The Low achievers fell within the upper middle class range; Drop-outs and High achievers fell within the lower upper class range.

TABLE 22

Sex, Handedness and SES Comparisons of Drop-outs, Low Achievers and High Achievers

	Drop-outs		Low Achievers		High Achievers	
SEX:	#	%	#	%	#	%
males	10	58.8	1	64.7	9	40.9
females	7	41.2		35.3	13	59.1
statistical analysis			chi^2=2.45 (df=2)			
HANDEDNESS:						
right	16	94.1	13	76.5	20	90.9
left	1	5.9	4	23.5	2	9.1
statistical analysis			chi^2=2.81 (df=2)			
	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD
SES (family):	61.8	12.0	59.0	10.7	61.8	12.3
statistical analysis			F(2,50)=0.297			

Biographical and Background Information Questionnaire

Chi-square analyses of the parents' responses to this questionnaire, gathered in the Spring of 1977, indicated that there were no significant differences among the Drop-outs, Low achievers and High achievers in French immersion in terms of preschool attendance, parental attitudes towards the French language and its speakers, parents' desire to learn to speak French and the courses taken, the exposure to French in the home and neighbourhood, the number of siblings enroled in French immersion, and advantaged home backgrounds as indicated by the number of books in the home and the parents' efforts to read to the child.

The parents' reasons for enroling their children in French immersion are summarized in Table 23 for the Drop-outs, Low achievers and High achievers. Parents' reasons were classified in ten categories. A maximum of three reasons were coded for each case. Parents of children in all three groups indicated that

TABLE 23

Frequency of Occurrence of Ten Categories of Parents' Reasons for Enroling Children in French Immersion for the Low Achievers and High Achievers

	Drop-outs	Low Achievers	High Achievers
1. Opportunity to learn to speak French, to have proficiency in two official Canadian languages.	11	11	14
2. Most painless and efficient way to teach a child a language, the younger the better for teaching a child to speak a new language comfortably and well.	5	6	9
3. Very positive attitude of child (interested, eager, enthusiastic).		3	1
4. Availability of program in local school (no English kindergarten).	1		1
5. Increase future employment opportunities.	5	3	4
6. Increase understanding of other cultural groups.	2	2	2
7. Program is a challenge and should help prevent boredom in the second kindergarten year.	1	1	0
8. Communication enrichment (all language skills will be improved).	3		1
9. Good experience with French immersion of siblings or friends.	1	1	2
10. General betterment of education (any second language is of value).	1	1	9

French immersion was an opportunity to learn to speak French (#1) most frequently as a reason for enroling the children in French immersion. Parents of all three groups also tended to view French immersion as an efficient way to teach a second language (#2). In contrast to the reasons cited by parents of Low achievers and Drop-outs, parents of High achievers frequently indicated that any second language is of value and contributes to the betterment of education (#12). However, the parents of these groups tended to have similar reasons for choosing the French immersion program and did not differ in terms of the instrumental-integrative orientation dichotomy described by Gardner and Lambert (1959). All parents tended to have a predominantly integrative orientation toward second language learning.

Grade One Parents' Questionnaire

At the grade one level, chi-square analyses indicated significant differences among these three groups in terms of three items on the Parents' Questionnaire.

Parents reported more difficulty in the grade one program for Drop-outs and Low achievers compared to the High achievers. The results of the overall chi-square analysis and one-sample chi-square tests computed to determine group differences are presented in Table 24. In addition, parents reported that a greater proportion of Drop-outs and Low achievers received special help in grade one compared to High achievers. The results of these chi-square analyses are also presented in Table 24.

Parents of these three groups differed in their expectations that their children would require special help during the 1979-80 school year. Although many parents were undecided, significantly more parents of Drop-outs expected that their children would require special help in the future in comparison with Low achievers and High achievers in French immersion, and significantly more parents of High achievers did not expect their children to encounter difficulty in school.

In terms of educational plans for the 1979-80 school year, 11 Drop-outs will enter English grade one, five will repeat English grade one and one child will

TABLE 24

Chi-square Analyses Comparing Drop-outs, Low Achievers and High Achievers in terms of Difficulty and Special Help in School as reported by parents

	Drop-outs		Low Achievers		High Achievers		One-sample chi^2 [1]
	#	%	#	%	#	%	
Reported difficulty in grade one (parents):							
difficulty	10	58.8	8	47.1	3	13.6	6.47*
no difficulty	7	41.2	9	52.9	19	86.4	3.61
statistical analysis			chi^2=9.31** (df=2)				
Special help in grade one?							
yes	10	58.8	7	41.2	2	9.1	6.41*
no	7	41.2	10	58.8	20	90.9	3.22
statistical analysis			chi^2=11.15** (df=2)				
Special help next year?							
yes	4	23.5	1	5.9	0	0	4.50*
no	5	29.4	6	35.3	15	68.2	4.13*
don't know	8	47.1	10	58.8	7	31.8	1.40
statistical analysis			chi^2=11.56* (df=4)				

---

[1] degrees of freedom=1 for each one-sample chi-square test.

* $p < .05$

** $p < .01$

enter a special education class. All parents of both Low achievers and High achievers indicated that they expected to enrol their children in French immersion grade two for the coming school year. Thus, in spite of the difficulties encountered in French immersion by the Low achievers, their parents are committed to the program and expect their children to advance to the appropriate grade level.

Teachers' Advice re French Immersion Enrolment

The results of chi-square analyses of the four-year-old kindergarten, five-year-old kindergarten and grade one teachers' advice regarding French immersion enrolment are presented in Table 25. The overall chi-square analyses were significant at the three grade levels. One-sample chi-square tests were computed to determine group differences. At the four-year-old kindergarten level, teachers advised French immersion enrolment for approximately half of the Drop-outs and

TABLE 25

Chi-square Analyses Comparing Drop-outs, Low Achievers and High Achievers in terms of Teachers' Advice re French Immersion Enrolment

	Drop-outs		Low Achievers		High Achievers		One-sample Chi^2 [1]
	#	%	#	%	#	%	
Four-year-old kindergarten teachers' advice:							
advised	7	46.7	7	50.0	16	88.9	5.34*
not advised	7	46.7	7	50.0	1	5.6	7.22**
undecided	1	6.7	0	0	1	5.6	0.54
statistical analysis			chi^2=10.13* (df=4)				
Five-year-old kindergarten teachers' advice:							
advised	8	53.3	13	76.5	22	100.0	2.20
not advised	7	46.7	4	23.5	0	0.0	9.33**
statistical analysis			chi^2=12.13** (df=2)				
Grade one teachers' advice:							
advised	0	0	6	35.3	22	100	20.50**
advised, with reservations	3	17.6	7	41.2	0	0	9.30**
not advised	14	82.4	4	23.5	0	0	18.67**
statistical analysis			chi^2=50.14** (df=4)				

---

[1] degrees of freedom=1 for each one-sample chi-square test.

* $p < .01$

** $p < .05$

half of the Low achievers. French immersion was not advised by four-year-old kindergarten teachers for only two High achievers because of emotional/social adjustment problems and health problems. The tendency for four-year-old kindergarten teachers to advise French immersion enrolment for half of the Drop-outs and half of the Low achievers indicates that this advice is not a good predictor of children who will encounter difficulty in the French immersion program. In support of their advice to enrol Drop-outs and Low achievers in French immersion, four-year-old kindergarten teachers cited several reasons for this advice including the child's good potential, well developed language skills, good adjustment in school, good listening skills, and suppportive home situations.

Even at the five-year-old kindergarten level, teachers advised French immersion enrolment for half of the Drop-outs and for approximately 75% of the Low achievers. Again teachers advised French immersion enrolment for children who encountered difficulty in the program. The reasons cited by teachers for advising French immersion enrolment for Drop-outs and Low achievers included the child's good attitude toward learning, good potential, persistence and maturity.

At the grade one level, teachers tended to advise against French immersion enrolment for the Dropouts. One of their main concerns was that the children were behind their peers in French immersion and would require special help to catch up to them. With regard to Low achievers, the teachers did not advise French immersion enrolment for 24% of the children. Teachers advised against French immersion enrolment for these Low achievers on the basis of the child's immaturity, low ability, short attention span, poor listening skills or poor attitude toward learning. French immersion was advised for 35% of Low achievers because the children had good potential, good French language skills or a good attitude toward learning. French immersion was advised "with reservations" for 41% of the Low achievers. The reservations cited most frequently by the teachers were that the child required remedial assistance in French reading and had difficulties in French comprehension and French oral skills. French immersion was advised for 100% of the High achievers, without any reservations. The reasons cited by teachers for advising

French immersion for High achievers included good French language skills, good potential, a good attitude toward learning and good emotional/social adjustment.

Four-year-old Kindergarten Teachers' Ratings

Chi-square analyses of teachers' ratings of ability, social maturation and motivation are presented in Table 26 for the Drop-outs, Low achievers and High achievers. Significant chi-square analyses of ability and social maturation ratings were followed by one-sample chi-square tests to determine group differences. Drop-outs and Low achievers tended to be rated as Average in ability in comparison to High achievers who were more frequently rated as Above Average in ability. Low achievers differed from both Drop-outs and High achievers in the high representation of Below Average ratings of social maturation for this group. In contrast, Drop-outs tended to be rated as Average and High achievers as Average or Above Average.

TABLE 26

Chi-square Analyses Comparing Drop-outs, Low Achievers and High Achievers in terms of Four-Year-Old Kindergarten Teachers' Ratings of Ability, Social Maturation and Motivation

		Drop-outs		Low Achievers		High Achievers		One-Sample[1] Chi^2
		#	%	#	%	#	%	
	Below Average	0	0	1	5.9	0	0	2.32
ABILITY	Average	12	70.6	11	64.7	6	27.3	3.71
	Above Average	5	29.4	5	29.4	16	72.7	3.98*
Statistical Analysis		Chi2 = 11.95* (df=4)						
	Below Average	2	11.8	7	41.2	2	9.1	6.66**
SOCIAL MATURATION	Average	14	82.4	6	35.3	11	50.0	3.86*
	Above Average	1	5.9	4	23.5	9	40.9	3.75
Statistical Analysis		Chi^2 = 14.11** (df=4)						
	Below Average	2	11.8	1	5.9	0	0	
MOTIVATION	Average	13	76.5	12	70.6	13	59.1	
	Above Average	2	11.8	4	23.5	9	40.9	
Statistical Analysis		Chi2 = 6.08 (df=4)						

[1] Degrees of Freedom = 1 for each one-sample chi-square test.

* $p < .05$

** $p < .01$

Five-year-old Kindergarten Teachers' Ratings

Results of the significant chi-square analyses of teachers' ratings of functioning level, comprehension of French and oral skills in French are presented in Table 27. One-sample chi-square tests were computed to determine group differences. There was a significant difference among these groups in terms of ratings of functioning level as beginning kindergarten. Eighteen per cent of Low achievers were rated at the beginning kindergarten level. No Drop-outs or High achievers were rated at this level. Although there were no significant group differences in ratings of mid kindergarten and ready for grade one, more High achievers tended to be rated as ready for grade one. Only 47% of Drop-outs and 35% of Low achievers were rated as ready for grade one versus 68% of High achivers. Thus, at the end of five-year-old kindergarten, teachers indicated that 53% of Drop-outs, 64% of Low achievers and 32% of High achievers were functioning below the level expected at the end of this program. The Low achievers appeared to have the

TABLE 27

Chi-square Analyses Comparing Drop-outs, Low Achievers and High Achievers in terms of Five-Year-Old Kindergarten Teachers' Ratings of Functioning Level, French Comprehension and French Oral Skills

		Drop-outs		Low Achievers		High Achievers		One-Sample[1] Chi^2
		#	%	#	%	#	%	
FUNCTIONING LEVEL	Beginning Kdg	0	0	3	17.6	0	0	6.00*
	Mid Kdg	8	53.3	8	47.1	7	31.8	1.25
	Ready for Gr.1	7	46.7	6	35.3	15	68.2	2.58
Statistical Analysis		Chi^2 = 9.72* (df=4)						
COMPREHENSION OF FRENCH	Below Average	6	40.0	6	35.3	0	0	9.00*
	Average	8	53.3	10	58.8	7	31.8	1.54
	Above Average	1	6.7	1	5.9	15	68.2	15.54**
Statistical Analysis		Chi^2 = 25.95** (df=4)						
FRENCH ORAL SKILLS	Below Average	9	60.0	6	35.3	0	0	12.45**
	Average	5	33.3	10	58.8	9	40.9	1.17
	Above Average	1	6.7	1	5.9	13	59.1	13.62**
Statistical Analysis		Chi^2 = 26.44** (df=4)						

[1] Degrees of Freedom = 1 for each one-sample chi-square test.

* $p < .05$

** $p < .01$

greatest number of children who were progressing slowly in school.

There were significant group differences in terms of Below Average and Above Average ratings of both comprehension of French and French oral skills. Significantly fewer High achievers had Below Average ratings, and Significantly more High achievers had Above Average ratings in comparison to Drop-outs and Low achievers on both of these scales. Thus, the High achievers identified in terms of performance in French in grade one did well in the development of French language skills at the five-year-old kindergarten level as well. At least one Drop-out and at least one child who was identified as a Low achiever in grade one had done well in kindergarten and had been rated as Above Average in French comprehension and French oral skills by the five-year-old kindergarten teacher.

Grade One Teachers' Ratings

The grade one teachers' ratings of French comprehension and oral skills were used to define the groups of Low achievers and High achievers. Thus, the three groups were not compared in terms of these variables. The results of chi-square analyses of functioning level, French reading skills and confidence and willingness in French are presented in Table 28. One-sample chi-square tests were computed to determine group differences. Ratings of functioning level suggested that the Drop-outs encountered the greatest difficulty in school. Although teachers indicated the functioning level of only 11 Drop-outs, only 18% of these were rated as ready for grade two compared to 47% of Low achievers and 100% of High achievers.

Only five drop-outs were rated in terms of reading skills in French since reading is not introduced in the grade one core French program. Comparisons of High and Low achievers in French reading indicated that children who were rated as Above Average in French comprehension and oral skills (High achievers) also tended to be rated as Above Average in French reading (77%). Only one child who was not rated as Above Average

TABLE 28

Chi-square Analyses Comparing Drop-outs, Low Achievers and High Achievers in terms of Grade One Teachers' Ratings of Functioning Level, French Reading Skills and Confidence and Willingness in French

		Drop-outs		Low Achievers		High Achievers		One-Sample[1] Chi^2
		#	%	#	%	#	%	
FUNCTIONING LEVEL	Early Grade 1	4	36.4	1	5.9	0	0	11.50**
	Mid Gr.1	5	45.5	8	47.1	0	0	11.33**
	Ready for Gr.2	2	18.2	8	47.1	22	100	8.96**
Statistical Analysis		Chi^2 = 29.18** (df=4)						
FRENCH READING SKILLS	Below Average	2	40.0	3	17.6	0	0	7.09**
	Average	3	60.0	13	76.5	5	22.7	6.90**
	Above Average	0	0	1	5.9	17	77.3	7.58**
Statistical Analysis		Chi^2 = 26.94** (df=4)						
CONFIDENCE/ WILLINGNESS IN FRENCH	Below Average	3	21.4	4	23.5	0	0	5.50*
	Average	9	64.3	12	70.6	3	13.6	8.40**
	Above Average	2	14.3	1	5.9	19	86.4	18.92**
Statistical Analysis		Chi^2 = 31.74** (df=4)						

[1] Degrees of Freedom = 1 for each one-sample chi-square test.

* $p < .05$

** $p < .01$

in comprehension and oral skills received an Above Average rating in French reading.

The High achievers demonstrated confidence and willingness to use the French language as rated by the grade one teachers. Most of the Low achievers and Drop-outs were rated as Average on this variable (71% and 64%, respectively).

Difficulty and Special Help in School

Chi-square analyses indicated significant differences in terms of teachers' reports of difficulty encountered and special help received at the five-year-old kindergarten and grade one levels for the Drop-outs, Low achievers and High achievers. One-sample chi-square tests were computed to delineate group differences. The results of the chi-square analyses are presented in Table 29. Significantly greater proportions of Drop-outs and Low achievers encountered difficulty and received special help in both five-year-old kindergarten

TABLE 29

Chi-square Analyses Comparing Drop-outs, Low Achievers and High Achievers in terms of Difficulty and Special Help in Five-Year Old Kindergarten and Grade One

	Drop-outs		Low Achievers		High Achievers		One-Sample[1] Chi^2
	#	%	#	%	#	%	
Difficulty in Five-Year-Old Kindergarten?							
Yes	12	80.0	13	76.5	3	13.6	6.90*
No	3	20.0	4	23.5	19	86.4	10.11**
Statistical Analysis			Chi^2 = 21.76** (df=2)				
Special Help in Five-Year-Old Kindergarten?							
Yes	10	66.7	10	62.5	2	9.1	9.40**
No	5	33.3	6	37.5	20	90.9	6.55*
Statistical Analysis			Chi^2 = 16.34** (df=2)				
Difficulty in Grade 1?							
Yes	10	58.8	11	64.7	3	13.6	10.43**
No	7	41.2	6	35.3	19	86.4	5.27*
Statistical Analysis			Chi^2 = 12.75** (df=2)				
Special Help in Grade 1?							
Yes	8	47.1	9	52.9	0	0	12.00**
No	9	52.9	8	47.1	22	100	5.35*
Statistical Analysis			Chi^2 = 15.93** (df=2)				

[1] Degrees of Freedom = 1 for each one-sample chi-square test.

* $p < .05$

** $p < .01$

and grade one. In five-year-old kindergarten, children received special help primarily in social areas while remedial reading was most prevalent at the grade one level for both Drop-outs and Low achievers. However, teachers reports of difficulty and the need for special help do not reliably indicate which children will drop out of French immersion since Low achievers continued in the program in spite of the difficulties encountered. Nor does reported difficulty predict low achievement in French immersion since three High achievers (14%) were reported to have encountered difficulty in both kindergarten and grade one, although no High achiever received special help in grade one. The types of difficulties encountered by High achievers were short attention span and emotional/social adjustment problems in kindergarten and special difficulties (eg. coordination, perceptual) in grade one.

Tactual Performance Test

Analyses of covariance with WPPSI Full Scale IQ

(FSIQ) as the covariate were computed for the Drop-outs, Low achievers and High achievers on Tactual Performance Test measures obtained in four-year-old kindergarten (modified three-block formboard) and in five-year-old kindergarten (standard six-block board). When the effects of FSIQ were controlled, significant group differences were found at the five-year-old kindergarten level. The effects of group were significant for the time per block measures with the dominant and nondominant hands.

Discriminant Function Analyses

Stepwise multiple discriminant function analyses (SPSS SUBPROGRAM DISCRIMINANT, Nie et al., 1975) were computed among Drop-outs, Low achievers and High achievers to determine which variables best discriminated the Drop-outs from children who continued in the French immersion program with high or low success. Separate discriminant function analyses were computed for the four-year-old kindergarten variables (Early Identification Assessment Battery) and the five-year-old kindergarten variables

(Kindergarten Follow-up Assessment Battery). The 38 four-year-old kindergarten variables and the 31 five-year-old kindergarten variables included in these analyses are listed in Appendix 10.

Drop-outs versus High achievers: Stepwise multiple discriminant function analysis of the four-year-old kindergarten variables yielded a single discriminant function which significantly separated the Drop-outs and High achievers at the multivariate level, Wilks Lambda (49)=.0013, $p < .01$. Overall 100% of the children were correctly classified according to group. These findings are presented in Table 30. Of the 38 variables from the four-year-old kindergarten Early Identification Assessment Battery 29 variables were selected by the stepwise method for inclusion in the single discriminant function. Univariate analyses of these 29 variables indicated that the two groups were significantly different on 16 of these measures. Group means, standard deviations, the results of the univariate analyses and standardized canonical discriminant function coefficients for the 29 measures are presented in Table 31.

TABLE 30

Discriminant Function Comparison of the Drop-outs and High Achievers on the Four-Year-Old Kindergarten Variables

Actual Group	N	Predicted Group[a]			
		Drop-outs		High Achievers	
		N	%	N	%
Drop-outs	17	17	100	0	0
High Achievers	22	0	0	22	100

[a] overall correct classification: 100%

In comparison to the Drop-outs, High achievers in French immersion had a significantly higher IQ (FSIQ, Matrices), higher scores on readiness measures (WRAT spelling, CIRCUS tests), more highly developed language manipulation skills (word segmenting), lower ratings of inattentive-passive behavior, higher ratings of auditory comprehension and spoken language in English, better personal-social behavior, and demonstrated higher levels of manual dexterity, self-confidence, cooperation and interest when assessed at the four-year-old kindergarten level.

Examination of standardized canonical discriminant function coefficients, which are presented in Table 31, indicated that knowledge of letters and numbers (CIRCUS #5), together with behavior ratings of attention, interest and inattentive-passive behavior contributed most highly to the discriminant function. Readiness measures of auditory discrimination and problem-solving (CIRCUS #7, #13), picture-naming, color-naming and ratings of auditory comprehension and spoken language also contributed highly to the discriminant function.

TABLE 31

Means, Standard Deviations and F Ratios For Univariate Comparisons of Drop-outs and High Achievers on the Early Identification Assessment Battery

	Drop-outs		High Achievers			Discriminant Function Coefficients
	$\overline{X}$	SD	$\overline{X}$	SD	F Ratio	
FSIQ	114.27	9.87	129.36	10.94	18.35**	4.86
Matrices	16.13	4.09	20.27	4.99	7.07*	7.88
WRAT Spelling	0.38	0.32	0.74	0.39	8.10**	6.02
Word Segmenting:						
Total Syllables	8.53	3.82	10.86	2.62	4.87*	-5.58
Observer's Checklist:						
C: Manual Dexterity	4.67	1.29	5.68	1.29	5.54*	-5.23
G: Self-confidence	4.80	1.57	5.82	1.44	4.17*	-5.51
I: Cooperation	5.00	1.31	6.05	1.25	5.99*	3.93
J: Interest	4.73	1.22	5.68	1.09	6.14*	-22.50
Inattentive-passive	23.71	19.18	7.08	9.42	12.30**	26.78
Auditory Comprehension	12.00	2.27	15.59	2.44	20.40**	14.98
Spoken Language	15.13	2.85	18.82	3.08	13.54**	-16.97
Personal-Social Behavior	23.33	4.64	29.46	3.96	18.54**	-4.25
CIRCUS:						
2: How Much & How Many	28.87	4.01	34.73	3.76	20.54**	-10.15
5: Finding Letters & Numbers	14.87	4.21	18.59	1.44	14.88**	23.58
7: How Words Sound	37.47	3.72	42.32	1.86	27.57**	-11.44
13: Think It Through	18.53	4.24	24.00	3.56	18.02**	-13.82
SES	61.43	12.29	61.75	12.30	0.56	-2.00
Picture-naming	139.33	43.79	118.27	27.93	3.20	-11.20
Colour-naming	8.87	2.56	9.46	0.80	1.03	11.07
Observer's Checklist:						
A: Motor activity	4.93	1.83	4.90	1.07	0.26	2.93
D: Amount of speech	5.60	1.85	5.96	1.09	0.54	5.36
E: Attention	5.13	1.85	5.36	1.65	0.16	27.53
Renfrew:						
Information	24.97	2.72	26.71	2.94	3.30	-7.85
Grammar	26.93	4.10	28.86	3.55	2.33	5.27
Conners:						
Conduct Problem	14.27	11.12	5.68	9.71	3.61	-2.68
Anxiety	20.01	14.25	14.85	15.78	1.03	-11.53
Hyperactivity	23.72	28.43	11.36	14.89	2.98	-3.27
Orientation	12.07	1.44	17.05	12.67	2.28	-7.31
Tactual Performance Test:						
Total Time Per Block	12.26	5.67	10.82	0.14	1.42	8.96

[1] Degrees of Freedom = 1,35 for each analysis.

* $p < .05$

** $p < .01$

Stepwise multiple discriminant function analysis of variables from the five-year-old Kindergarten Follow-up Assessment yielded a single discriminant function which significantly separated the Drop-outs and High achievers at the multivariate level, Wilks Lambda (26)=0.053, $p < .01$. Overall 100% of the children were correctly classified according to group. These findings are presented in Table 32. Of the 31 variables, 16 were selected by the stepwise method for inclusion in the single discriminant function. Univariate analyses of these 16 variables indicated that the two groups were significantly different on 13 of these measures. Group means, standard deviations, the results of the univariate analyses and standardized canonical discriminant function coefficients are presented in Table 33. These two groups are easily distinguished, particularly on the basis of knowledge of letters, numbers and object names in French, academic achievement in English and both receptive and expressive English language skills. Of particular interest was the better performance of High achievers on the Tactual

TABLE 32

Discriminant Function Comparison of the Drop-outs and High Achievers on Five-Year-Old Kindergarten Variables

Actual Group	N	Predicted Group[a]			
		Drop-outs		High Achievers	
		N	%	N	%
Drop-outs	17	17	100	0	0
High Achievers	22	0	0	22	100

[a] overall correct classification: 100%

TABLE 33

Means, Standard Deviations and F Ratios For Univariate Comparisons of Drop-outs and High Achievers on the Kindergarten Follow-up Assessment Battery

	Drop-outs		High Achievers			Discriminant Function Coefficients
	$\bar{X}$	SD	$\bar{X}$	SD	F Ratio[1]	
Peabody IQ	113.92	13.56	123.91	12.10	5.19*	0.77
Renfrew:						
Information	22.25	9.13	26.16	3.33	9.55*	1.20
Grammar	25.57	4.72	29.57	5.54	4.91*	-0.74
Tactual Performance Test:						
Total Time Per Block	6.99	3.31	5.25	0.69	5.57*	-1.04
Picture-naming (French)	88.50	3.08	93.71	2.83	26.56**	2.13
WRAT:						
Reading grade	1.08	0.32	1.75	0.62	13.73**	1.48
Spelling grade	1.14	0.17	1.39	0.37	5.71**	-1.32
Arithmetic grade	1.13	0.38	1.84	0.29	39.67**	1.44
French letter naming	5.71	4.68	9.05	4.52	4.44*	-0.72
French counting/numbers	10.93	0.73	11.81	0.75	11.84**	-0.77
CIRCUS #9:						
Listen to the Story	19.71	1.98	22.33	3.29	7.11*	0.64
Observer's Checklist:						
B: Performance Rate	4.29	0.99	5.86	1.49	11.92**	-1.28
C: Manual Dexterity	4.86	0.53	5.95	1.63	5.87*	1.77
D: Amount of Speech	4.71	1.73	5.57	1.81	1.96	-1.24
Age	5.99	0.28	5.61	1.31	1.11	1.49
Hyperactivity	31.50	32.42	13.24	22.21	3.93	-0.85

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[1] Degrees of Freedom = 1,33 for each analysis.

* $p < .05$

** $p < .01$

Performance Test. High achievers required significantly less time per block to insert the six blocks in the board, compared to the Drop-outs. This finding is consistent with the results of two earlier studies (Trites and Price, 1976, 1977) in which performance on the Tactual Performance Test distinguished children who had difficulty in French immersion from groups of children diagnosed as having learning disability, as hyperactive, as having emotional/ social disturbance, or as having minimal brain dysfunction, and also distinguished children who dropped out of the French immersion program, who were below age nine, from children in French immersion.

Examination of the standardized canonical discriminant function coefficients presented in Table 33 indicated that picture-naming in French, behavior ratings of performance rate, manual dexterity and amount of speech, age, tactual performance and academic achievement in English contributed most highly to the discriminant function.

Drop-outs versus Low Achievers: Stepwise discriminant function analysis of the four-year-old kindergarten variables yielded a single discriminant function which separated the Drop-outs and Low achievers at the multivariate level, Wilks Lambda (27)=0.0005, $p < .01$. Overall 88% of the children were correctly classified according to group. These findings are presented in Table 34. Of the 38 variables, 21 were selected by the stepwise discriminant method for inclusion in the single discriminant function. Univariate analyses of these 21 variables indicated that these two groups were significantly different on only one variable, age, $\underline{F}(1,25)=8.70$, $p < .01$.

The means, standard deviations, results of the univariate analyses and standardized canonical discriminant function coefficients are presented in Table 35. The Drop-outs were slightly older than the Low achievers. There were no other significant differences between these groups. Examination of the standardized canonical discriminant function coefficients indicated that age plus several behavior ratings (amount of motor activity, anxiety, cooperation, conduct problems and spoken language) contributed most highly to the discriminant function. Picture-naming and color-naming also contributed highly

TABLE 34

Discriminant Function Comparison of the Drop-outs and Low Achievers on the Four-Year-Old Kindergarten Variables

Actual Group	N	Predicted Group[a]			
		Drop-outs		High Achievers	
		N	%	N	%
Drop-outs	17	17	100	0	0
Low Achievers	17	4	23.5	13	76.5

[a] overall correct classification: 88.24%

TABLE 35

Means, Standard Deviations and F Ratios For Univariate Comparisons of Drop-outs and Low Achievers on the Early Identification Assessment Battery

	Drop-outs		Low Achievers			Discriminant Function Coefficients
	$\overline{X}$	SD	$\overline{X}$	SD	F Ratio[1]	
Age	4.95	0.25	4.67	0.23	8.70**	-23.65
SES	61.43	12.29	57.18	11.31	0.85	-10.89
FSIQ	114.27	9.87	112.17	10.00	0.30	5.63
WRAT:						
Reading	0.82	0.38	0.93	0.44	0.52	3.08
Arithmetic	0.50	0.35	0.64	0.30	1.28	7.08
Picture-naming	139.33	43.79	138.42	39.50	0.32	14.47
Colour-naming	8.87	2.56	8.92	1.00	0.41	-13.79
Word Segmenting:						
Total Syllables	8.53	3.82	8.00	4.22	0.12	9.02
Observer's Checklist:						
A: Motor Activity	4.93	1.83	5.92	1.51	2.24	30.20
B: Performance Rate	5.27	1.33	4.33	1.92	2.21	-7.68
C: Manual Dexterity	4.67	1.29	4.75	1.29	0.28	-6.83
F: Anxiety	5.33	1.49	4.67	1.07	1.68	-31.03
G: Self-confidence	4.80	1.57	4.67	2.10	0.36	11.52
I: Cooperation	5.00	1.31	4.75	1.60	0.20	23.63
Renfrew:						
Information	24.97	2.72	22.83	3.65	3.04	-8.07
Conduct Problem	14.27	11.72	4.88	5.70	3.10	-19.51
Inattentive-Passive	23.71	11.18	29.20	25.25	0.41	-2.85
Auditory Comprehension	12.00	2.27	11.25	2.77	0.60	-12.63
Spoken Language	15.13	2.85	14.50	3.03	0.31	15.47
Personal-Social Behavior	23.33	4.64	24.17	2.59	0.31	9.85
CIRCUS:						
9: Listen to the Story	15.33	3.64	16.67	2.67	1.12	10.39

[1] Degrees of Freedom = 1,25 for each analysis.

** $p < .01$

to the discriminant function.

Stepwise discriminant function analysis of the five-year-old kindergarten variables yielded a single discriminant function which significantly separated the Drop-outs and Low achievers at the multivariate level, Wilks Lambda (32)=0.0356, $p < .01$. Overall 91% of the children were correctly classified according to group. These findings are presented in Table 36. Of the 31 variables, 16 were selected by the stepwise method for inclusion in the single discriminant function. Univariate analyses of these 16 variables indicated that the two groups were significantly different on only one variable, age, $\underline{F}(1,27)=5.76$, $p < .05$. The Drop-outs were slightly older than the Low achievers. The results of the univariate analyses and standardized canonical discriminant function coefficients are presented in Table 37.

Tactual Performance Test scores, English language skills, knowledge of numbers and letters in French, English readiness and several behavior ratings were entered in the discriminant function but were not

TABLE 36

Discriminant Function Comparison of the Drop-outs and Low Achievers on the Five-Year-Old Kindergarten Variables

Actual Group	N	Predicted Group[a]			
		Drop-outs		Low Achievers	
		N	%	N	%
Drop-outs	17	15	88.2	2	11.8
Low achievers	17	1	5.9	16	94.1

[a] Overall correct classification: 91.18%.

TABLE 37

Means, Standard Deviations and *F* Ratios For Univariate Comparisons of Drop-outs and Low Achievers on the Kindergarten Follow-up Assessment Battery

	Drop-outs		Low Achievers			Discriminant Function Coefficients
	$\bar{X}$	SD	$\bar{X}$	SD	*F* Ratio[1]	
Age	5.99	0.28	5.74	0.29	5.76*	-3.17
Peabody IQ	113.93	13.56	107.73	16.32	1.23	2.03
Renfrew:						
Information	22.25	4.13	23.83	4.28	1.03	4.07
Grammar	25.57	4.72	25.07	4.40	0.89	-7.18
Tactual Performance Test:						
Memory	3.29	1.14	3.07	1.16	0.26	-1.88
Location	1.29	1.00	1.80	1.61	1.05	3.05
Total Time Per Block	6.99	3.31	8.28	8.90	0.26	1.42
Picture naming (French)	**88.50**	3.08	**89.6**	3.36	0.84	3.95
Knowledge of letters (French)	5.71	4.68	7.47	3.58	1.29	-1.05
CIRCUS:						
9: Listen to the Story	19.71	1.98	19.33	2.13	0.25	2.74
13: Think It Through	24.57	2.93	22.73	3.39	2.43	-3.80
Observer's Checklist:						
D: Amount of Speech	4.71	1.73	4.87	1.41	0.68	-4.52
E: Attention	4.57	1.40	4.73	1.28	0.11	0.84
F: Anxiety	5.14	1.99	4.73	1.98	0.31	0.81
H: Effort	4.71	2.16	4.60	2.77	1.81	3.48
Tension-Anxiety	29.29	29.53	25.20	24.70	0.17	-0.77

[1] Degrees of Freedom = 1,27 for each analysis.

* $p < .05$

significant at the univariate level. Although the Drop-outs tended to obtain better scores on most of these measures, the differences were not significant. On the Tactual Performance Test time per block measure, the Drop-outs tended to have faster performance levels.

The standardized canonical discriminant function coefficients presented in Table 37 indicated that English grammar and information scores, picture-naming in French, ratings of amount of speech and effort contributed most highly to the discriminant function.

Summary and Discussion of Comparisons of Drop-outs, Low Achievers and High Achievers in French Immersion

By the Spring of 1979, 17 children had dropped out of French immersion following academic difficulties (Drop-outs), 17 children were identified as Low achievers in French immersion and 22 children were defined as High achievers in French immersion. Eleven Drop-outs completed the five-year-old kindergarten year in French immersion and then transferred to the English program for grade one.

Thus, the data collected for these children in five-year-old kindergarten reflects progress in the French immersion program. The remaining six Drop-outs were enroled in French immersion for the grade one program and transferred to the English program during the grade one year.

Parents reported that significantly more Drop-outs and Low achievers had difficulty in grade one and received help compared to the High achievers. Their reports were not fully consistent with the grade one teachers' reports of difficulty and special help in grade one. The trends were generally the same, however, teachers reported a greater incidence of difficulty and special help for the Low achievers than was indicated by the parents. According to the teachers' reports, a little over half of the Drop-outs and of Low achievers encountered difficulty in grade one and approximately half of the children in each group received special help. Even among the High achievers, three children encountered difficulty. However, none of the High achievers received special help.

The Low achievers and High achievers were defined in terms of their French comprehension and French oral skills. The correspondence between these groupings and the grade one teachers' ratings of French reading skills and the child's willingness and confidence in the French language was examined. High achievers, who were rated as Above Average in French comprehension and oral skills in grade one, also tended to be rated as Above Average in French reading and in their confidence and willingness in the French language. Teachers tended to rate Low achievers as Average or Below Average on these scales, similar to the ratings of French comprehension and French oral skills. Thus, there was a fairly high correspondence among the various ratings of French language achievement in the Spring of grade one.

In terms of general functioning level at the end of grade one, fewer Drop-outs were rated as ready for grade two and more Drop-outs were rated at the early grade one level compared to Low achievers and High achievers. Although this information was available for only 11 of the 17 Drop-outs, it suggests that in the eyes of grade one teachers, Drop-outs were experiencing greater school difficulty than the children who continued in French immersion in spite of low levels of achievement. This situation is further indicated by the school programs in which the children are to be enroled for the coming school year. All of the Low achievers and High achievers are expected to be enroled in French immersion grade two. However, five Drop-outs will repeat the English grade one program and one Drop-out will enter a Special Education class. Thus, the Drop-outs encountered greater difficulty in grade one than did the Low achievers or High achievers who continued in French immersion. It is possible that the time spent in French immersion may have held back progress in the English program and some of the Drop-outs will require more time to cover what was missed. Three of the children who will repeat grade one in English had dropped out of French immersion during the grade one year and had missed some of this program. Two children who will repeat grade one had completed the five-year-old kindergarten year in French immersion and were in the English grade one program for the full year.

Grade one teachers advised against French immersion enrolment for children who had already dropped out of the program as a result of difficulties and were thus not predicting future expectations of difficulty. They appeared to be concerned that these children would be far behind their peers in the French language if they were again enroled in French immersion at the end of the grade one program.

Half of the Low achievers were not at the expected functioning level at the end of French immersion grade one. In addition, teachers clearly advised French immersion enrolment for only 35% of the Low achievers. French immersion teachers advised that 23% of the Low achievers not continue in the program and they advised enrolment in French immersion "with reservations" for another 41% of the Low achievers. Thus, grade one teachers considered that 64% of the Low achievers (11 children) were likely to continue to encounter difficulty in the French immersion program.

At the end of grade one, all High achievers were rated as ready for grade two and teachers advised French immersion enrolment for all of these children, without reservations.

The children who encountered academic difficulties in French immersion and dropped out of the program were compared to Low achievers in French immersion and to High achievers in French immersion to determine the characteristics which distinguished Drop-outs from children who had success in French immersion and from children who continued in French immersion in spite of a low level of achievement.

Although the sex differences were not significant, there tended to be a greater representation of girls among the High achievers. Even though there were more boys among the Drop-outs, and particularly among the Low achievers, sex cannot be used as a basis for distinguishing among children who have different outcomes in French immersion. Girls and boys were equally likely to drop out of French immersion as a result of academic difficulties; however, boys were more likely to continue in French immersion even though they were not particularly successful and had low achievement in French language skills.

In previous studies, Trites and Price (1976, 1977) found a high representation of left-handed children among children who encountered difficulty in French immersion and among children who dropped out of the program. In the present study, there were no significant differences in handedness among Drop-outs, Low achievers and High achievers. There tended to be more left-handed children among the Low achievers but the trend was not significant. Thus, one cannot predict that left-handed children will do more poorly in French immersion than right-handed children.

The Drop-outs, Low achievers and High achievers could not be distinguished on the basis of biographical and background information gathered before they entered the primary French immersion program. They came from similar socioeconomic classes, i.e., the upper middle to lower upper class range. This high socioeconomic background, together with the high number of books in their homes and the frequency of parents reading to these children indicated that children in all three groups came from advantaged home backgrounds. The groups did not differ significantly in terms of preschool attendance, although more High achievers had attended preschool (86%) compared to the Drop-outs (65%) and the Low achievers (41%).

Parents of the children in all three groups expressed an integrative orientation towards their children's opportunity to learn to speak French in the primary French immersion program. All of the parents had positive attitudes towards the French language and its speakers. The parents did not differ in their desire to learn to speak French or in the frequency of taking courses to learn it themselves. The Drop-outs, Low achievers and High achievers did not differ in terms of their exposure to French at home or in the neighbourhood, or in the number of siblings who were enroled in French immersion. Thus, upon entry into French immersion five-year-old kindergarten, there were no family characteristics, preschool experiences or social environment characteristics which could be identified as factors which would influence the different outcomes in French immersion for these groups.

In an earlier report, Trites and Price (1978) pointed out that teachers follow informal criteria for recommending or not recommending French immersion enrolment for their pupils. Parents may consult teachers about the adviseability of enroling their children in French immersion and it is considered an important goal of this study to determine the validity of teachers' advice regarding French immersion enrolment. Four-year-old kindergarten teachers advised French immersion enrolment for half of the Drop-outs and for half of the Low achievers. Thus, four-year-old kindergarten teachers' advice to enrol a child in French immersion does not predict that the child will be successful in the program. A child may drop out of French immersion or have a low level of achievement even if enrolment in French immersion is advised by the four-year-old kindergarten teacher. The advice of teachers at this level was more reliable with regard to High achievers - they advised French immersion enrolment for 89% of High achievers. Thus, before entry into the French immersion five-year-old kindergarten program, teachers were able to judge fairly accurately the children who would be highly successful in the program but they did not consistently advise against French immersion for children who encountered difficulty and dropped out of French immersion, or for children who continued in the program with poor levels of achievement in French language skills. Taken as a whole then, other advice of four-year-old kindergarten teachers is an unreliable predictor of success in French immersion.

At the five-year-old kindergarten level, teachers continued to advise French immersion enrolment for half of the Drop-outs even though 11 of these children subsequently entered an English grade one program the following September. This again indicated that teachers' advice is not a reliable predictor of children who will drop out of French immersion as a result of academic difficulties. The five-year-old kindergarten teachers also advised French immersion enrolment for 75% of the Low achievers. Thus, their advice to enrol a child in French immersion grade one did not indicate that the child would have success in this program. Similar to the findings at the four-year-old kindergarten level, the five-year-old kindergarten teachers were consistent in advising French immersion enrolment for all of the High achievers. These findings indicate that kindergarten teachers' advice regarding French immersion enrolment is a better predictor of high levels of success than of difficulty in the program.

The four-year-old kindergarten teachers' ratings of the children in terms of ability, social maturation and motivation were examined to determine whether Drop-outs, Low achievers and High achievers differed on these scales before entry into French immersion five-year-old kindergarten. These groups did not differ in terms of their motivation with most children rated as Average or Above Average on this scale. Teachers described more High achievers as Above Average in ability compared to Drop-outs and Low achievers. Thus, high ability level as rated by four-year-old kindergarten teachers is an indication that a child will be successful in French immersion. However, one cannot reliably predict high levels of success in French immersion solely on the basis of high ability. Twenty-nine per cent of Drop-outs and of Low achievers were also described as having Above Average ability and yet they encountered difficulty and dropped out of French immersion, or they continued in the program with a low rate of success. Significantly more of the Low achievers were rated as Below Average in social maturation compared to the Drop-outs and High achievers. Immaturity at the four-year-old kindergarten level indicated the possibility of future difficulty in succeeding in French immersion for less than half of the Low achievers. One cannot identify a pattern of levels of ability, social maturation and motivation as rated by four-year-old kindergarten teachers which will reliably predict children who will drop out of French immersion, or children who will continue in the program with a low level of achievement.

How is success in five-year-old French immersion kindergarten related to success in grade one? To answer this question, one must decide upon a measure of success in five-year-old kindergarten. If one examines teachers' ratings of overall functioning level as predictors of later success in French immersion, it is important to assess the validity of teachers' ratings of functioning level in reference to other criteria of academic success. In the comparisons discussed in this section, low and high achievement in French immersion have been defined in terms of percentile ranks on a psychometric test of French comprehension skills combined with grade one teachers' ratings of French comprehension and French oral skills. In reference to these criteria, grade one teachers' ratings of 100% of the High achievers as ready for grade two suggests that this rating category closely corresponds to the criteria for High achievers. However, 47% of Low achievers, as defined by the above criteria, were also rated as ready for grade two. This diminishes the correspondence between high achievement and a rating of ready for grade two. If one relates this situation at the grade one level to the five-year-old kindergarten situation, kindergarten teachers' ratings of functioning level cannot be assumed to share strict correspondence with other criteria of success, that is, the teachers' rating of ready for grade one does not necessarily indicate a high level of achievement in French language skills in five-year-old kindergarten. One must also consider the teachers' ratings of French comprehension and French oral skills in kindergarten to gain a more complete picture of success in kindergarten.

The 17 Drop-outs had been in French immersion kindergarten when they were assessed in the Spring of 1978. Teachers' ratings were thus an indication of their progress in the French immersion program. Five-year-old kindergarten teachers' ratings of overall functioning level indicated that approximately half of the Drop-outs were ready for grade one in the Spring of five-year-old kindergarten and that the remaining half were functioning at the mid kindergarten level. Although half of the Drop-outs were considered to be at the expected level at the end of kindergarten, they dropped out of the program as a result of academic difficulties. The rating of functioning level does not appear to reflect the difficulties encountered in French immersion by this group of children.

The correspondence between functioning level at the end of five-year-old kindergarten and later achievement in French immersion was weak for Low and High achievers. Thirty-five per cent of the Low achievers were rated as ready for grade one at the end of French immersion five-year-old kindergarten, 18% were rated at the early kindergarten level and 47% were rated at the mid kindergarten level. Only 68% of High achievers were rated as ready for grade one at the end of kindergarten and 32% were functioning at the mid kindergarten level. On the basis of these ratings, one cannot predict that a child who does not reach the expected level of achievement at the end of five-year-old kindergarten will necessarily have a low level of achievement in French immersion grade one - one third of the Low achievers in grade one were at the expected level on completion of five-year-old kindergarten and one third on the High achievers were below the expected level on completion of the kindergarten program.

To determine the relationship between success in five-year-old kindergarten and success in grade one,

one may use the five-year-old kindergarten teachers' ratings of French comprehension and French oral skills as measures of success in kindergarten. The criteria for low and high achievement in French immersion were based upon French language skills in grade one and are thus more closely related to these kindergarten measures of success than is the rating of overall functioning level.

In five-year-old kindergarten, the Drop-outs had the highest proportion of Below Average ratings of French comprehension and French oral skills compared to the Low and High achievers. The Drop-outs appeared to have had great difficulty in acquiring French language skills, especially oral skills. However, at least half of these children were rated as Average in French comprehension and one third were rated as Average in oral skills. Poor achievement in acquiring French language skills in kindergarten as rated by teachers, was related to dropping out of French immersion for only half of the children who transferred to the English program.

Success in acquiring comprehension and oral skills in French in five-year-old kindergarten, defined by Above Average ratings, is a good indication of later achievement in French language skills in grade one. Only one child who was rated as Above Average on these scales in kindergarten was later identified as a Low achiever in French immersion grade one, and only one child rated as Above Average later dropped out of the program. In addition, low achievement in French language skills in French immersion kindergarten, defined by Below Average ratings of French comprehension and oral skills, is a good indication of later low levels of achievement. However, one cannot predict the level of achievement in French immersion grade one for the children who were rated as Average in French comprehension and oral skills in kindergarten. These children have an almost equal chance of becoming Low or High achievers in French immersion grade one, and some will drop out of the program.

Thus, on the basis of French immersion five-year-old kindergarten teachers' ratings of French comprehension and French oral skills at the end of the kindergarten program, one can predict high achievement in grade one for the children rated as Above average. One can also predict that the children rated as Below Average in comprehension and oral skills will have low achievement in French immersion grade one or will withdraw from the program. It is difficult to distinguish between these latter outcomes, although Below Average ratings of French oral skills were more highly associated with dropping out of the program. Thus, prediction of the extreme groups who were rated as Above or Below Average in French language skills at the end of five-year-old kindergarten was fairly reliable. However, the outcomes for the Average group in kindergarten were not clearly predictable.

The five-year-old kindergarten teachers' reports of difficulty and special help in the kindergarten program were examined as predictive of various outcomes in the French immersion program. If a child was reported to have encountered difficulty in five-year-old kindergarten, he was more likely to drop out of the program or to be a Low achiever in French immersion grade one than to attain a high level of success. However, difficulty in kindergarten was not a reliable predictor since 14% of High achievers also encountered difficulty in kindergarten and approximately 20% of both Drop-outs and Low achievers did not have difficulty in kindergarten. Difficulty in kindergarten did not distinguish between Drop-outs and Low achievers. Approximately 80% of each of these groups encountered difficulty in kindergarten. The findings regarding receiving special help in kindergarten were similar to those for reported difficulty. Receiving special help indicated that the child would drop out of French immersion (67%) or be a Low achiever (63%). However, a child who did not receive special help in kindergarten could also drop out (33%) or be a Low achiever (38%).

The extent to which the Drop-outs could be discriminated from the High achievers and Low achievers in French immersion on the basis of predictive data gathered in four- and five-year-old kindergarten was assessed in stepwise multiple discriminant function analyses. The Drop-outs and High achievers were easily separated. The children in these groups were classified correctly into their groups with 100% accuracy on the basis of the Early Identification Assessment Battery (four-year-old kindergarten) and also on the basis of the five-year-old Kindergarten Follow-up Assessment Battery. At the four-year-old kindergarten level, univariate analyses of variance yielded significant differences between the High achievers and Drop-outs on measures of IQ; readiness skills including quantitative concepts, knowledge of letters and numbers, auditory discrimination and problem-solving; WRAT spelling test scores; the ability to segment words into syllables; the level of manual dexterity, self-confidence, cooperation and interest observed during the four-year-old kindergarten assessment; the level of inattentive-passive behavior as rated by teachers; and the teachers ratings of auditory comprehension, spoken language and personal-social behavior. The High achievers were better than the Drop-outs on all of these measures. Of the above measures, the highest weights in the discriminant function were given to inattentive-passive behavior, knowledge of letters and numbers, interest, spoken language, auditory comprehension, problem-solving, auditory discrimination and quantitative concepts. However, other measures were given high weights in the discriminant function although the group differences were not significant. These included attention, anxiety, picture-naming, color-naming, and the Tactual Performance Test. Thus, if one were to administer 14 tests of the Early Identification Assessment Battery to children at the end of four-year-old kindergarten, to gather socioeconomic status information and to have the children rated by their teachers on the Conners Teacher Questionnaire and the Myklebust Pupil Rating Scale and by the examiners on the Observers' Checklist, one could predict with extreme accuracy, those children who were likely to encounter difficulty in a primary French immersion program and drop out of the program, and those children who were likely to do very well in the French immersion program. The 14 test measures would include IQ, CIRCUS readiness tests, the Tactual Performance Test, picture- and color-naming, the WRAT (spelling), word-segmentation, and the Renfrew Action Picture Test.

At the five-year-old kindergarten level, the Drop-outs and High achievers differed significantly on 14 of the 16 variables included in the discriminant function. The High achievers had better expressive and receptive language skills in English, better performance on the Tactual Performance Test; better academic achievement in English reading, spelling and arithmetic; better knowledge of numbers, letters and object names in French; better listening comprehension in English; and higher ratings of performance rate and manual dexterity. Of these measures, the highest weights in the discriminant function were given to knowledge of object names in French, manual dexterity, reading, arithmetic and spelling grade scores, performance rate and the Tactual Performance Test. Thus, at the five-year-old kindergarten level, one can accurately predict Drop-outs and High achievers on the basis of 12 tests of the Kindergarten Follow-up Assessment Battery, together with age, teachers' ratings of hyperactivity (Conners), and the Observers' Checklist. The tests of importance from the five-year-old kindergarten test battery were the Peabody Picture Vocabulary Test, the Renfrew Action Picture Test, the Tactual Performance Test, the WRAT, knowledge of object names, numbers and the alphabet in French, and the CIRCUS test of listening comprehension in English (#9).

Thus, one can separate Drop-outs and High achievers on the basis of both the Early Identification Assessment Battery and the five-year-old Kindergarten Follow-up Assessment Battery. An important finding of these discriminant function analyses was the role of the Tactual Performance Test in separating Drop-outs and

High achievers. In a previous study, Trites and Price (1976) found that children who encountered difficulty in French immersion had a unique pattern of skills and deficits characterized by a high IQ and excellent motor and sensory functions and yet poor performance on the Tactual Performance Test, a complex psychomotor problem-solving task. The findings were interpreted as evidence of a maturational lag in the temporal lobe regions of the brain. In a second study, Trites and Price (1977) found that children who dropped out of French immersion performed more poorly on the Tactual Performance Test than children who remained in the program and were doing well. Again, Drop-outs performed more poorly on the Tactual Performance Test. The difference was statistically significant in younger children (below age nine), but, consistent with a maturational lag hypothesis, the differences had disappeared in the over-age-nine group, although the trend was still in favour of the Control group. In the Assessment of Readiness for Primary French Immersion reported here, the Tactual Performance Test was selected by the stepwise procedure for inclusion in the discriminant function separating Drop-outs and High achievers at both the four-year-old and five-year-old kindergarten levels. The group differences were significant at the five-year-old kindergarten level, and the Tactual Performance Test scores were given fairly high weights in the discriminant function at both levels. The lack of significant group differences on the Tactual Performance Test measure in four-year-old kindergarten may be related to the nature of this test. To accomodate the special circumstances in testing four-year-olds, the Tactual Performance Test was modified. The children were required to place only three blocks (circle, square and triangle) in spaces arranged in a horizontal row in a board. Thus, compared to the six block board used at the five-year-old kindergarten level, the four-year-old kindergarten measure did not allow for as much variation in performance and the task was much less difficult. The Tactual Performance Test at the four-year-old kindergarten level was thus different from the tasks used in the previous studies (Trites and Price, 1976, 1977) which indicated significant group differences, and also from the task at the five-year-old kindergarten level which indicated significant group differences. The role of the Tactual Performance Test in the present follow-up of children entering primary French immersion programs is consistent with the hypothesis of a maturational lag in the temporal lobe regions of the brain for children who drop out of French immersion.

High levels of correct classification were also obtained in the discriminant function analyses of the Drop-outs versus Low achievers. Based on the Early Identification Assessment Battery (four-year-old kindergarten), 88% of the children were correctly classified according to group. Based on the five-year-old Kindergarten Follow-up Assessment Battery, 91% were correctly classified according to group. At both kindergarten levels, the only significant difference between the Drop-outs and Low achievers was in terms of age, with the Drop-outs being slightly older. However, on the basis of four-year-old kindergarten measures, correct classification was made on the basis of 21 variables which were included in the discriminant function. High weights on the discriminant function were given to ratings of anxiety and motor activity, cooperation, conduct problems and spoken language, to age, picture-naming, auditory comprehension, SES and listening comprehension skills. Thus, age, SES, teachers' ratings (Conners and Myklebust scales), the Observers' Checklist and tests of IQ, academic achievement, picture- and color-naming, word-segmenting, listening comprehension in English (CIRCUS #9) and the Renfrew Action Picture Test yielded a good separation between Drop-outs and Low achievers.

At the five-year-old kindergarten level, 16 measures from the Kindergarten Follow-up Assessment Battery were selected to discriminate Drop-outs and Low achievers. The highest weights on the discriminant function were given to Renfrew grammar and information scores, amount of speech, picture-naming, listening comprehension, effort and age. At the five-year-old kindergarten level, one can separate Drop-outs from Low achievers on the basis of age, SES, the Peabody Picture Vocabulary Test, the Renfrew Action Picture Test, the Tactual Performance Test (memory, location and total time per block), picture-naming in French, knowledge of the alphabet in French, listening comprehension and problem-solving skills (CIRCUS #9, 13), the Observers' Checklist and the teachers' rating of tension-anxiety (CONNERS). Performance levels on the two groups varied on these measures. The Drop-outs tended to have higher receptive vocabulary skills in English, higher English grammar scores, better memory and time per block scores on the Tactual Performance Test, better listening comprehension and problem-solving skills, and put forth greater effort. However, Drop-outs tended to be less attentive, less talkative, more anxious, to give less verbal information, and to have poorer knowledge of object names and alphabetic characters in French.

On the basis of the information gathered in four-year-old kindergarten, including the Biographical and Background Information Questionnaire, teachers' ratings and the Early Identification Assessment Battery, the following picture of the future Drop-out from the French immersion program arises. The Drop-out has Bright Normal intelligence. Four-year-old kindergarten teachers rate the Drop-out as Average or Above Average in ability, and as Average in social maturation and motivation. The Drop-out may be a boy or a girl, may be right- or left-handed and is likely to have attended preschool. He/she comes from an advantaged lower upper class home. His/her parents have positive attitudes towards French immersion, the French language and its speakers. His/her four-year-old kindergarten teacher may have advised that he/she be enroled in French immersion. However, if the four-year-old kindergarten teacher advised against French immersion enrolment, it was highly likely that the child would encounter difficulty in the French immersion program. The Drop-out may be described as a passive child lacking interest, attentiveness, self-confidence and cooperativeness. The Drop-out tends to have poor auditory discrimination skills and receives low ratings of auditory comprehension and spoken language. The Drop-out has learned less than his peers from his environment in terms of knowledge of the basics of numbers, letters, quantitative concepts and colors. The Drop-out is less flexible in terms of problem-solving, both manually (Tactual Performance Test) and verbally (word segmenting, CIRCUS #13). The Drop-out is less adept in manipulative skills as indicated by poorer performance on the WRAT spelling subtest which involves copying marks, by poorer performance on the Tactual Performance Test and by lower ratings of manual dexterity.

If the five-year-old kindergarten teachers rated a child as functioning at the beginning kindergarten level and as Below Average in French comprehension and French oral skills, advised against French immersion enrolment and reported difficulty and special help for the child in kindergarten, then this child has likely encountered difficulty in French immersion. However, he/she may have continued in the program as a Low achiever or dropped out. At the five-year-old kindergarten level, the child who drops out of French immersion has, relative to High achievers, poorer receptive and expressive vocabulary skills in English, poorer academic achievement in reading, spelling and arithmetic measured in English, poorer listening comprehension in English, poorer problem-solving and manual dexterity as indicated by the Tactual Performance Test and observers' ratings, and poorer French language skills. Despite these lower performance levels, the Drop-outs have made good progress in acquiring reading, spelling and arithmetic skills in English, and had well-developed receptive and expressive language skills in English. Thus, the key factors interfering with progress in French immersion appear to be in acquiring French language skills and factors related to performance on the Tactual Performance Test.

Although the Drop-outs and Low achievers were separated with a high degree of accuracy in the stepwise discriminant function analyses, they were quite similar except in age. One could characterize a Low achiever as a child from an upper middle class home where his parents had positive attitudes to the French immersion program. The Low achiever was more likely to be a boy who had not attended preschool. He likely received Below Average ratings of social maturation in four-year-old kindergarten and his teacher may have advised against enrolment in French immersion five-year-old kindergarten. The Low achiever is likely to have had difficulty and special help in five-year-old French immersion kindergarten, to be rated as functioning at the beginning or mid kindergarten level, and to have Below Average ratings of French comprehension and French oral skills. However, this picture was not consistent and the factors outlined are indications of difficulty in French immersion, but not of the outcome in terms of low achievement versus dropping out.

At the four-year-old kindergarten level, the Low achievers were younger than the Drop-outs and they tended to have higher reading and arithmetic scores (WRAT) and better listening comprehension. There were several indications of behavioral differences between these groups. The Low achievers tended to be more inattentive-passive, had fewer conduct problems, were less anxious, less self-confident and less cooperative.

At the five-year-old kindergarten level, the discriminant function analysis pointed to differences between Drop-outs and Low achievers such that Low achievers tended to have poorer English language skills, listening comprehension, problem-solving, and Tactual Performance Test scores. However, Low achievers were more attentive, more talkative, less anxious, gave more verbal information and had better knowledge of object names and alphabetic characters in French. The behavioral characteristics of the Low achievers, together with their better knowledge of French and their younger age may be factors which lead parents to continue to enrol these children in the French immersion program in spite of difficulties.

Discriminant Function Analysis of Low Achievers and High Achievers in French Immersion

Questionnaire Data: Comparisons of Dropouts, Low achievers and High achievers have been discussed in a previous section. The differences found between Low and High achievers in French immersion in terms of parents' and teachers' questionnaires are summarized below. Although there were more girls among the High achievers, there were no significant differences between High and Low achievers in terms of sex, handedness or socioeconomic status. No significant differences were found in terms of the Biographical and Background Information Questionnaire which indicated that both groups came from advantaged home backgrounds and that their parents had positive attitudes towards the French language and its speakers.

Kindergarten and grade one teachers differed in terms of their recommendations regarding French immersion enrolment for these two groups. At the four-year-old kindergarten level, teachers advised French immersion enrolment for only half of the Low achievers and for 89% of the High achievers. At the five-year-old kindergarten level, French immersion was advised for all of the High achievers and for 76% of the Low achievers. At the grade one level, teachers advised French immersion enrolment for all of the High achievers and for 35% of the Low achievers. However, grade one teachers did not advise French immersion enrolment for 24% of Low achievers and advised enrolment "with reservations" for 41% of Low achievers. Thus, there were 11 Low achievers who were considered to be at risk for future difficulty in French immersion.

Four-year-old kindergarten teachers tended to rate Low achievers as Average in ability and to rate High achievers as Above average. In addition, more Low achievers were considered to be Below average in social maturation compared to High achievers.

Low and High achievers differed in terms of the acquisition of French language skills in French immersion five-year-old kindergarten. Significantly more Low achievers were rated as Below average in the comprehension of French and in French oral skills. In contrast, High achievers tended to receive Above average ratings on these scales. In terms of overall functioning level in five-year-old kindergarten, Low achievers tended to be at the early to mid kindergarten level. Thirty-five per cent of Low achievers and 68% of High achievers were rated as ready for grade one. The difficulty encountered in French immersion five-year-old kindergarten by Low achievers was also evident in the teachers' reports that significantly more Low achievers encountered difficulty and received special help in kindergarten compared to High achievers.

The Low and High achievers were defined in terms of their progress in acquiring French language skills in grade one. Scores on the French Comprehension Test, Level One, and grade one teachers' ratings of French comprehension and French oral skills were the basis for determining low and high achievement. Teachers' ratings of other French language skills indicated that High achievers tended to be Above Average in French reading skills and in their confidence and willingness in the French language. Low achievers tended to be rated as Average on these scales. However, only 47% of Low achievers were rated as ready for grade two in the Spring of the grade one program. In contrast, all of the High achievers were rated as ready for grade two. Teachers reported that significantly more Low achievers encountered difficulty and received special help in grade one. In spite of a low level of achievement and the difficulties encountered in the French immersion program, all of the parents of Low achievers expected that their children would enter a French immersion grade two program the following September.

Discriminant Function Analysis of Low and High Achievers in French Immersion: Relative Rates of Success

Relative rates of success among children who remained in the French immersion program for kindergarten and grade one were examined. The High and Low achievers in French immersion were identified in terms of percentile ranks on the French Comprehension Test, Level One (Barik, 1976) and grade one teachers' ratings of French comprehension and oral skills. This procedure was described in an earlier section. These two groups were compared in a stepwise discriminant function analysis of four-year-old kindergarten variables. This analysis yielded a single discriminant function which separated the High and Low achievers at the multivariate level, Wilks Lambda (45)=0.0012, $p < .01$. Overall, 87% of the children were correctly classified according to group. These findings are presented in Table 38. Of the 38 variables, 29 were selected by the stepwise discriminant method for inclusion in the single discriminant function. Univariate analyses of these 29 variables indicated that these two groups were significantly different on 22 of the measures. Group means, standard deviations, the results of the univariate analyses and standardized canonical discriminant function coefficients are presented in Table 39.

At the four-year-old kindergarten level, compared to Low achievers, High achievers had significantly higher IQ scores, better receptive and expressive English language skills, better readiness skills, better scores

TABLE 38

Discriminant Function Comparison of High Achievers and Low Achievers in French Immersion on Four-year-old Kindergarten Variables

Actual Group	N	Predicted Group[a]			
		High Achievers		Low Achievers	
		N	%	N	%
High achievers	22	22	100	0	0
Low achievers	17	5	29.4	12	70.6

[a] overall correct classification: 87.18%

TABLE 39

Means, Standard Deviations and *F* Ratios For Univariate Comparisons of High Achievers and Low Achievers on the Early Identification Assessment Battery

	High Achievers		Low Achievers			Discriminant Function Coefficients
	$\bar{X}$	SD	$\bar{X}$	SD	*F* Ratio[1]	
FSIQ	129.36	10.94	112.17	10.00	20.34**	12.85
Peabody IQ	120.41	13.51	108.75	17.93	4.59*	-7.08
Matrices	20.27	4.99	15.00	4.73	8.99*	-7.79
WRAT Spelling	0.73	0.40	0.27	0.29	12.88**	13.97
Word Segmenting						
Total Syllables	10.86	2.62	8.00	4.22	5.98**	-2.16
Observers' Checklist						
A: Motor Activity	4.91	1.07	5.92	1.51	5.18*	5.88
B: Performance Rate	5.77	1.15	4.33	1.92	7.51**	-6.68
C: Manual Dexterity	5.68	1.29	4.15	1.29	4.07*	-22.94
D: Amount of Speech	5.96	1.09	4.75	1.91	5.53*	-8.99
F: Anxiety	6.00	1.07	4.67	1.07	12.05**	5.67
H: Effort	5.68	1.04	4.33	1.16	12.07**	13.39
I: Cooperation	6.05	1.25	4.75	1.60	6.81**	-1.81
J: Interest	5.68	1.09	4.08	1.00	17.79**	12.41
Renfrew:						
Information	26.71	2.94	22.83	3.65	11.35**	5.71
Grammar	28.86	3.55	26.08	3.06	5.23*	11.74
Inattentive-Passive	7.08	9.42	29.20	25.25	13.70**	7.36
Auditory Comprehension	15.59	2.44	11.25	2.77	22.34**	26.12
Spoken Language	18.82	3.08	14.50	3.03	15.43**	-21.87
Personal-social Behavior	29.46	3.96	24.17	2.59	17.23**	13.87
CIRCUS:						
2: How Much and How Many	34.73	3.76	28.58	4.54	17.92**	-10.76
5: Finding Letters & Numbers	18.59	1.44	15.50	4.08	10.49**	3.40
7: How Words Sound	42.32	1.86	36.83	3.07	42.37**	4.58
SESFAM	61.76	12.31	57.18	11.31	1.13	-2.75
Colour-naming	9.46	0.80	8.92	1.00	2.95	-4.09
Conduct Problem	5.68	9.71	4.88	5.70	0.69	6.82
Anxiety	14.85	15.78	25.56	16.54	3.46	-12.38
Hyperactivity	11.36	14.89	17.13	15.61	1.12	17.86
Orientation	17.05	12.67	11.92	2.19	1.91	-2.12
Motor Coordination	10.82	2.06	9.50	1.83	3.42	-7.88

[1] Degrees of Freedom = 1,32 for each analysis.

* $p<.05$

** $p<.01$

in the manipulation of the speech signal and better behavior ratings.

Examination of the standardized canonical discriminant function coefficients presented in Table 39 indicated that behavior ratings including auditory comprehension, spoken language, manual dexterity, hyperactivity, interest, anxiety, and effort contributed most highly to the discriminant function.

Stepwise discriminant function analyses of the five-year-old kindergarten measures yielded a single discriminant function which significantly separated the Low achievers and High achievers at the multivariate level, Wilks Lambda (13)=0.125, $p < .01$. Overall 97% of the children were correctly classified according to group. These findings are presented in Table 40. Of the 31 variables, 13 were selected by the stepwise method for inclusion in the single discriminant function. Univariate analyses of the 13 variables indicated that the two groups were significantly different on five of these measures. Means, standard deviations, the results of the univariate analyses and standardized canonical

TABLE 40

Discriminant Function Comparison of the High Achievers and Low Achievers on the Five-year-old Kindergarten Measures

Actual Group	N	Predicted Group[a]			
		High Achievers		Low Achievers	
		N	%	N	%
High achievers	22	22	100	0	0
Low achievers	17	1	5.9	16	94.0

[a] overall correct classification: 97.44%

discriminant function coefficients are presented in Table 41. In comparison with Low achievers, High achievers in French immersion had higher scores at the five-year-old kindergarten level in terms of picture-naming in French, arithmetic grade level, and problem-solving abilities, had higher ratings of performance rate and lower ratings of inattentive-passive behavior.

Examination of the standardized canonical discriminant function coefficients presented in Table 41 indicated that behavior ratings contributed most highly to the discriminant function. These included ratings of self-confidence, interest, inattentive-passive behavior, performance rate and attention.

Predicting Achievement in Grade One French Immersion on the Basis of Criterion Measures Obtained in Four-Year-Old Kindergarten and in Five-Year-Old Kindergarten

Prediction of relative rates of success in the

TABLE 41

Means, Standard Deviations and F Ratios For Univariate Comparisons of High Achievers and Low Achievers on the Kindergarten Follow-Up Assessment Battery

	High Achievers		Low Achievers			Discriminant Function Coefficients
	$\overline{X}$	SD	$\overline{X}$	SD	F Ratio	
Word Segmenting:						
Total Syllables	11.62	2.13	11.60	2.20	0.68	0.43
Picture naming:(French)						
Time	909.48	49.97	887.07	64.71	1.48	-0.40
Errors	93.71	2.83	89.60	3.36	15.84**	-0.63
WRAT:						
Arithmetic Grade	1.84	0.29	1.11	0.42	37.91**	-0.57
CIRCUS:						
#13 Think it Through	26.38	2.84	22.73	3.39	12.30**	-0.65
Observers' Checklist:						
B: Performance Rate	5.86	1.49	4.47	2.07	5.52*	-0.80
E: Attention	5.38	1.50	4.73	1.28	1.84	-0.78
G: Self-confidence	5.57	1.69	4.60	1.72	2.84	-1.12
I: Effort	6.71	1.71	6.20	1.47	0.89	-0.44
J: Interest	5.38	1.63	5.27	1.49	0.46	1.24
Inattentive-Passive	7.00	11.27	41.33	30.52	22.50**	1.15
Hyperactivity	13.24	22.21	19.53	21.25	0.73	-0.61
Tactual Performance Test:						
Total Time Per Block	5.25	0.69	8.28	8.90	2.45	0.29

* $p < .05$
** $p < .01$

primary French immersion program was examined for the children who remained in French immersion to the end of grade one. Forward stepwise multiple linear regression analysis (SPSS SUBPROGRAM REGRESSION, Nie, et al., 1975) was employed to select a subset of variables from a group of variables which would form the best possible combination for predicting a given variable.. The predictive validity of measures obtained at the four-year-old kindergarten level (Early Identification Assessment Battery) was assessed in relation to measures of achievement in both French and English administered at the end of the French immersion grade one program. The variables included in the analyses from the four-year-old kindergarten battery and the grade one criterion variables are listed in Appendix 12. In addition to the four-year-old kindergarten test variables and behavior ratings, sex, hand dominance, preschool attendance, and the four-year-old kindergarten teachers' advice regarding French immersion enrolment were included in the multiple regression analyses following the procedures for including "dummy variables" (Nie, et al., 1975, p.373). Thus, a total of 43 predictors was available from the four-year-old kindergarten assessment.

The predictive validity of measures obtained at the end of five-year-old French immersion kindergarten (Kindergarten Follow-up Assessment Battery) was also assessed in relation to the grade one criteria. The five-year-old kindergarten predictive measures included in the multiple regression analyses are listed in Appendix 12. Sex, handedness and the five-year-old kindergarten teachers' advice regarding French immersion enrolment were included in the analyses according to the procedures for "dummy variables" (Nie, et al., 1975, p.373). A total of 34 predictors were used from the five-year-old kindergarten assessment.

Prediction of Achievement in French

Multiple regression analyses were computed for seven criterion measures of achievement in French assessed in the Spring of the French immersion grade one program. Cases with missing values were eliminated from all calculations through listwise deletion of missing data. A total of 116 of the 124 children in the French immersion group were involved in these analyses. Pearson product-moment correlations computed among the seven criterion and 43 four-year-old kindergarten predictor variables are presented in Table 42. Pearson product-moment correlations between criterion variables and 34 five-year-old kindergarten variables are presented in Table 43. The variable names corresponding to these abbreviations are listed in Appendix II.

The results of the multiple regression analyses are presented in Tables 44 through 73. The following information is listed in these tables: the predictors which attained the criteria required for entry into the stepwise multiple regression analyses (F=.01, T=.001, Nie, et al., 1976, p.346); the multiple correlation coefficient (MULTIPLE R) which indicates the direction and relative strength of the dependence which can be explained by linear dependence upon the predictor variables operating jointly; R^2 (R SQUARE) which indicates the proportion of variation of the criterion variable

TABLE 42

Pearson Product-Moment Correlations Computed Among The French Criterion Measures and Four-Year-Old Kindergarten Predictors

	YFRCOMPR	YFRPEAIQ	YFWRAR	YFWRAA	YPICTIM	YPICERR	YRENDR
AGE	0.34046	0.10953	0.13706	-0.08711	0.06037	0.21310	0.24240
SESFAM	0.05994	0.03823	0.05701	0.07297	-0.02535	-0.04449	0.06241
FSIQ	0.43091	0.35708	0.15204	0.28822	0.30285	0.24886	0.49544
PEABIQ	0.33095	0.26952	-0.02115	0.19392	0.23494	0.26040	0.29254
MATRS	0.38379	0.24190	-0.05619	0.11699	0.00625	0.17321	0.55900
WRAR	0.24593	0.04790	0.24004	0.28892	0.10578	0.24553	0.32057
WRAS	0.32690	0.07244	0.16971	0.18790	0.08385	0.13575	0.42955
WRAA	0.42258	0.21234	0.24664	0.27684	0.12998	0.33145	0.44334
PICTIME	-0.21612	-0.16916	-0.08541	-0.15172	-0.20923	-0.15945	-0.18507
PICERR	-0.30984	-0.16883	-0.06483	-0.26983	-0.26468	-0.27290	-0.28944
SYLTOT	0.26096	0.00098	0.22111	0.02561	0.06059	0.05168	0.28052
OBSA	-0.21638	-0.23923	-0.24144	-0.09689	0.09288	-0.06569	-0.13543
OBSB	0.18740	0.10244	-0.01957	0.01981	0.13364	0.20150	0.15965
OBSC	0.14848	0.06875	0.09949	-0.05974	-0.03787	0.13339	0.25512
OBSD	0.19839	0.00746	-0.08267	0.16065	0.20144	0.13674	0.10866
OBSE	0.33295	0.19055	0.12850	0.09647	-0.09129	0.24833	0.30116
OBSF	0.14982	0.06977	-0.00862	0.09899	0.02349	0.22795	0.22745
OBSG	0.09850	0.11269	-0.03672	-0.05901	0.06700	0.25514	0.09487
OBSH	0.22228	0.13577	0.13914	0.01293	-0.07750	0.16428	0.29908
OBSI	0.14982	0.01820	0.04979	-0.06352	-0.00788	0.21522	0.21060
OBSJ	0.29883	0.17328	0.07632	-0.02865	0.05258	0.24415	0.30048
RENINF	0.30630	0.05267	0.06248	0.15390	0.15856	0.27979	0.11198
RENGRAM	0.24704	0.08059	-0.03016	0.19733	0.10338	0.23713	0.06316
CONPROB	-0.06759	-0.27680	-0.08831	-0.17524	0.05195	-0.12600	-0.18223
CONPASS	-0.36447	-0.27966	-0.26548	-0.21106	-0.01107	-0.29622	-0.14769
CONANX	-0.11019	-0.14103	-0.05859	0.14056	0.04868	-0.15403	0.07231
CONHYP	-0.16656	-0.21652	-0.23305	-0.37570	-0.09983	-0.19306	-0.21463
AUDCOMP	0.38930	0.20116	0.27214	0.29931	0.21053	0.24630	0.41037
SPOKLAN	0.36937	0.18723	0.23253	0.35134	0.15273	0.23296	0.35419
ORIEN	0.13590	0.17164	0.12062	0.10753	0.05065	0.13320	0.11980
MOTCOR	0.15061	0.12625	0.29444	0.11508	-0.03141	0.02149	0.24101
PERSOC	0.26191	0.23322	0.28015	0.21287	0.08024	0.22401	0.33115
CIR2TOT	0.48335	0.24720	0.27359	0.31903	0.04429	0.31948	0.43443
CIR5TOT	0.43819	0.07908	0.26959	0.31063	0.00681	0.19797	0.30573
CIR7TOT	0.52137	0.32629	0.12529	0.22929	0.21534	0.31022	0.48752
CIR9TOT	0.35894	0.20396	0.12357	0.13574	0.05152	0.25256	0.31464
CIR13TOT	0.35862	0.25700	0.15044	0.22666	0.20427	0.21556	0.39245
TPBTOTAL	0.00193	-0.01622	0.02788	-0.26290	-0.02597	-0.11218	-0.00183
D1	0.01859	0.05093	-0.09476	-0.12785	-0.01341	-0.01777	0.07773
D2	0.13251	-0.03320	0.01978	0.08895	0.02570	0.05165	-0.00168
D3	0.06909	0.03203	0.10206	0.06913	0.09169	0.13061	-0.02294
D4	0.09172	-0.00775	0.03854	0.13450	-0.01004	0.01731	0.21090
D5	-0.23667	-0.05012	-0.11146	-0.19396	-0.25831	-0.09700	-0.20410

TABLE 43

Pearson Product-Moment Correlations Computed Among The French Criterion Measures and Five-Year-Old Kindergarten Predictors

	YFWRAR	YFWRAA	YPICTIM	YPICERR	YRENDR	YFRCOMPR	YFRPEAIQ
XAGE	0.01720	-0.05154	-0.11063	0.07763	0.03947	0.10290	-0.03915
XFRCOMPR	0.07545	0.22887	0.18313	0.33239	0.36396	0.50653	0.31523
XPEABIQ	0.01120	0.20315	0.30638	0.20199	0.40624	0.31201	0.36850
XRENINF	0.13794	0.04896	0.10534	0.09162	0.15510	0.25961	0.12174
XRENGRM	0.15653	0.06168	0.04830	0.13496	0.18478	0.33340	0.17106
XSEGSYL	0.13478	0.13379	-0.06443	-0.07925	0.10622	0.03336	-0.05518
XMEM	0.02550	0.10265	0.00243	0.17389	0.29828	0.20720	0.14945
XLOC	-0.11165	0.02226	0.08659	0.04051	0.22714	0.06746	0.11995
XPICTIM	0.01867	0.08865	0.18607	0.12215	0.10192	0.07522	0.08823
XWRARG	0.16903	0.19773	0.09541	0.27730	0.44036	0.20817	0.05358
XWRASG	0.25109	0.33268	0.12224	0.21767	0.40424	0.17472	0.12768
XWRAAG	0.38367	0.23958	0.21754	0.21871	0.38971	0.39709	0.18666
XFWRAR	0.22316	0.35862	0.21906	0.09295	0.12834	0.12505	-0.09019
XFWRAA	0.20562	0.15869	0.00320	0.13883	0.39954	0.31739	0.02467
XCIR9T	0.22362	0.17121	0.17802	0.28074	0.29259	0.33106	0.13188
XCIRI3T	0.11979	0.29089	0.20043	0.15695	0.32462	0.32909	0.25024
XOBSA	0.08079	0.14709	-0.05684	0.07100	0.02220	-0.01203	-0.00008
XOBSB	0.15716	0.24980	0.18052	0.13882	0.43853	0.30610	0.12307
XOBSC	0.11244	-0.05710	-0.07783	0.05250	0.32473	0.24095	0.01102
XOBSD	-0.02453	0.03591	0.12524	0.12488	0.21825	0.13585	0.03894
XOBSE	0.20388	0.16123	0.07239	0.16535	0.16138	0.24846	0.01830
XOBSF	0.05360	0.11149	0.16407	0.31864	0.22912	0.29311	0.14165
XOBSG	-0.00108	0.21303	0.12597	0.27555	0.26854	0.18403	0.06954
XOBSH	0.11091	0.14578	0.21218	0.08413	0.18711	0.21641	0.04111
XOBSI	0.04317	0.00114	0.01547	0.03501	0.19676	0.10695	-0.07710
XOBSJ	0.11278	0.00131	0.04709	0.11390	0.16114	0.16265	-0.05507
XCONCP	-0.13128	-0.21114	0.03848	-0.12808	-0.09221	-0.00210	-0.12183
XCONIP	-0.47447	-0.29979	-0.00319	-0.37254	-0.28028	-0.47278	-0.28697
XCONTA	-0.09580	0.09052	0.10702	0.00116	-0.06763	-0.07090	0.03549
XCONHY	-0.20706	-0.29546	0.02691	-0.30671	-0.13424	-0.16614	-0.21470
XTOTTPB	0.04906	-0.05209	0.04602	-0.00603	-0.19131	-0.04265	-0.07338
D1	-0.06668	-0.09406	-0.06644	-0.09056	0.09291	-0.01059	0.02679
D2	0.16619	0.12031	-0.05676	0.19671	0.09227	0.20963	0.04835
D3	0.10226	0.07086	0.09199	0.13152	-0.02055	0.07325	0.03631

explained by the predictor variables; the R^2 change (RSQ CHANGE) resulting at each successive step; and, the zero-order correlation between the criterion variable and each predictor variable (SIMPLE R).

French Comprehension Test, Level One: Simple correlations between raw scores on the French Comprehension Test and predictor variables from the four-year-old kindergarten Early Identification Assessment Battery (see Table 42) indicated that performance on this test of achievement in French was most highly related to readiness measures of auditory discrimination (CIR7TOT), quantitative concepts (CIR2TOT) and knowledge of letters and numbers in English (CIR5TOT, WRAA), and to IQ (FSIQ). Nonverbal IQ (MATRS), and teacher ratings of English language skills (AUDCOMP, SPOKLAN) and inattentive-passive behavior (CONPASS) also correlated highly with later achievement in the comprehension of French. Several other predictors correlated with the French Comprehension Test score ($r \geq .25$) and included age, academic achievement in English reading and spelling, expressive and receptive English language skills, problem-solving skills and levels of attention and personal-social behavior.

The results of the stepwise multiple regression analysis of four-year-old kindergarten predictors in relation to the French Comprehension Test criterion variable are presented in Table 44. Forty-two of the 43 predictors were included in the multiple regression yielding a multiple correlation of .80 accounting for 64% of the variance in raw scores on the French Comprehension Test, $F(42,73)=3.046$, $p < .01$. The CIRCUS readiness measure of auditory discrimination (CIR7TOT) was the best predictor accounting for 27% of the variance. Fifty per cent of the variance in French Comprehension Test scores could be accounted for on the basis of ten predictors including the measure of auditory discrimination, age, IQ, the behavior rating of inattentive-passive behavior, the Renfrew information score, knowledge of numbers and letters in English, four-year-old kindergarten teachers' advice to enrol the child in French immersion (D4), sex (D1), handedness (D2) and the modified Tactual Performance Test (three block board).

Simple correlations between the French Comprehension Test raw scores and the predictors from the five-

TABLE 44

Results of the Multiple Linear Regression Analysis of The French Comprehension Test, Level One, and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YFRCOMPR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
CIR7TOT	0.52137	0.27183	0.27183	0.52137
AGE	0.55811	0.31149	0.03966	0.34046
FSIQ	0.60288	0.36347	0.05198	0.43091
CONPASS	0.62588	0.39173	0.02826	-0.36447
RENINF	0.64256	0.41288	0.02115	0.30630
CIR5TOT	0.65856	0.43370	0.02082	0.43819
D4	0.67436	0.45476	0.02107	0.09172
D1	0.68569	0.47017	0.01541	0.01859
D2	0.69675	0.48546	0.01528	0.13251
TPBTOTAL	0.70471	0.49662	0.01116	0.00193
OBSA	0.71038	0.50464	0.00802	-0.21638
OBSD	0.71577	0.51233	0.00769	0.19839
OBSH	0.71996	0.51834	0.00601	0.22228
OBSJ	0.73390	0.53861	0.02027	0.29883
OBSI	0.74015	0.54782	0.00921	0.14982
SYLTOT	0.74574	0.55613	0.00831	0.26096
PEABIQ	0.75169	0.56504	0.00890	0.33095
CONPROB	0.75562	0.57095	0.00592	-0.06759
MATRS	0.75943	0.57673	0.00578	0.38379
CONANX	0.76362	0.58312	0.00638	-0.11019
CIR13TOT	0.76662	0.58771	0.00459	0.35862
WRAR	0.77086	0.59423	0.00652	0.24593
WRAA	0.77328	0.59797	0.00374	0.42258
CIR2TOT	0.77529	0.60108	0.00311	0.48335
OBSB	0.77766	0.60475	0.00368	0.18740
D5	0.78042	0.60905	0.00430	-0.23667
OBSC	0.78256	0.61240	0.00335	0.14848
OBSE	0.78420	0.61497	0.00257	0.33295
OBSG	0.78549	0.61700	0.00203	0.09850
WRAS	0.78667	0.61885	0.00184	0.32690
MOTCOR	0.78784	0.62070	0.00185	0.15061
AUDCOMP	0.78931	0.62302	0.00232	0.38930
PERSOC	0.79125	0.62608	0.00306	0.26191
ORIEN	0.79430	0.63091	0.00484	0.13590
OBSF	0.79541	0.63267	0.00176	0.14982
CIR9TOT	0.79645	0.63433	0.00166	0.35894
SESFAM	0.79698	0.63518	0.00085	0.05994
PICERR	0.79727	0.63564	0.00045	-0.30984
D3	0.79747	0.63596	0.00032	0.06909
CONHYP	0.79765	0.63624	0.00028	-0.16656
PICTIME	0.79784	0.63655	0.00031	-0.21612
RENGRAM	0.79792	0.63667	0.00012	0.24704
(CONSTANT)				

year-old Kindergarten Follow-up Assessment Battery (see Table 43) indicated that several measures correlated highly ($r \geq .25$) with French comprehension. These measures were the Primer version of the French Comprehension Test, the teachers' rating of inattentive-passive behavior (XCONIP), academic achievement in arithmetic in English and French (XWRAAG, XFWRAA), Peabody IQ (XPEABIQ), expressive language skills in English (XRENINF, XRENGRM), CIRCUS readiness measures (XCIR9T, XCIRI3T) and ratings of performance rate, attention and anxiety.

The results of the stepwise discriminant function analysis of the five-year-old kindergarten predictors and the criterion measure of French comprehension are presented in Table 45. Thirty-three of the 34 predictors were entered into the multiple regression analysis and yielded a multiple correlation of 176 accounting for 57% of the variance in French Comprehension Test scores, $F(33,84)=3.338$, $p < .01$. The Primer version of the French Comprehension Test was administered at the end of five-year-old kindergarten and performance on this test was the best single predictor of performance

TABLE 45

Results of the Multiple Linear Regression Analysis of The French Comprehension Test, Level One, and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YFRCOMPR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XFRCOMPR	0.50653	0.25657	0.25657	0.50653
XCONIP	0.64406	0.41482	0.15825	-0.47278
XRENGRM	0.65962	0.43510	0.02029	0.33340
XPEABIQ	0.67226	0.45194	0.01683	0.31201
XFWRAA	0.68447	0.46850	0.01657	0.31739
XOBSA	0.69632	0.48486	0.01636	-0.01203
XWRASG	0.70115	0.49161	0.00674	0.17472
XOBSC	0.70538	0.49757	0.00596	0.24095
XTOTTPB	0.71259	0.50779	0.01022	-0.04265
D2	0.71624	0.51300	0.00521	0.20963
XMEM	0.72006	0.51849	0.00549	0.20720
XLOC	0.72708	0.52864	0.01016	0.06746
XWRAAG	0.73034	0.53340	0.00475	0.39709
XOBSB	0.73272	0.53688	0.00348	0.30610
XOBSH	0.73615	0.54192	0.00504	0.21641
D1	0.73892	0.54600	0.00408	-0.01059
XSEGSYL	0.74116	0.54932	0.00332	0.03336
XRENINF	0.74337	0.55261	0.00329	0.25961
XCONHY	0.74532	0.55549	0.00289	-0.16614
XCIR13T	0.74741	0.55862	0.00312	0.32909
XOBSF	0.74923	0.56134	0.00272	0.29311
XOBSD	0.75125	0.56438	0.00304	0.13585
XWRARG	0.75213	0.56569	0.00131	0.20817
XCONTA	0.75322	0.56733	0.00164	-0.07090
XOBSG	0.75406	0.56861	0.00128	0.18403
XFWRAR	0.75482	0.56975	0.00114	0.12505
XAGE	0.75544	0.57069	0.00093	0.10290
XOBSI	0.75609	0.57168	0.00099	0.10695
XCONCP	0.75640	0.57214	0.00047	-0.00210
XOBSE	0.75667	0.57256	0.00041	0.24846
XCIR9T	0.75688	0.57287	0.00031	0.33106
D3	0.75703	0.57310	0.00023	0.07325
XPICTIM	0.75712	0.57324	0.00014	0.07522
(CONSTANT)				

at the grade one level, accounting for 26% of the variance. A combination of nine predictors accounted for 50% of the variance. These measures included the French Comprehension Test, Primer, ratings of inattentive-passive behavior, motor activity and manual dexterity, English language skills, knowledge of numbers in French, academic achievement in English spelling and the Tactual Performance Test score.

Thus the Early Identification Assessment Battery and the Kindergarten Follow-up Assessment Battery had predictive validity in relation to French Comprehension Test scores in grade one. Although these test batteries did not include all of the same measures, there was some overlap such that performance on the Tactual Performance Test, handedness, and ratings of inattentive-passive behavior and of the amount of motor activity were among the ten best predictors at both kindergarten levels. Four-year-old kindergarten teachers' advice to enrol a child in French immersion was among the ten best predictors of French comprehension test scores in grade one. However, the five-year-old kindergarten teachers' advice did not enter the multiple regression until step 22 and accounted for little of the variance in French Comprehension Test scores.

Test de Rendement en Français, Level One: Simple correlations between raw scores on the Rendement en Francais and four-year-old kindergarten predictor variables (see Table 42) indicated that performance on this measure of reading skills in French was most highly related to measures of auditory discrimination (CIR7TOT), IQ (FSIQ, MATRS), readiness skills in reading, spelling and arithmetic (CIR2TOT, CIR5TOT, WRAR, WRAS, WRAA) and ratings of English language skills (AUDCOMPT, SPOKLAN). Several other predictors correlated with the score on the Rendement en Français ($r \geq .25$) including problem-solving ability (CIR13TOT), behavior ratings of personal-social behavior, manual dexterity, attention, effort and interest, receptive vocabulary (PEABIQ) and expressive vocabulary skills (PICERR) in English, and the ability to manipulate the speech signal (SYLTOT).

The results of the stepwise multiple regression analysis for this criterion variable are presented in Table 46. Thirty-nine of the 43 four-year-old kinder-

TABLE 46

Results of the Multiple Linear Regression Analysis of The Test de Rendement en Francais, Level One, and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YRENDR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
MATRS	0.55900	0.31248	0.31248	0.55900
WRAR	0.62781	0.39414	0.08166	0.32057
AUDCOMP	0.65655	0.43106	0.03692	0.41037
CONPROB	0.67623	0.45729	0.02623	-0.18223
AGE	0.69033	0.47655	0.01926	0.24240
CONPASS	0.70478	0.49671	0.02016	-0.14769
SYLTOT	0.71602	0.51269	0.01597	0.28052
OBSG	0.72268	0.52226	0.00958	0.09487
FSIQ	0.73017	0.53314	0.01088	0.49544
SPOKLAN	0.73797	0.54460	0.01145	0.35419
CIR13TOT	0.74357	0.55290	0.00830	0.39245
D1	0.74904	0.56105	0.00816	0.07773
CIR2TOT	0.75321	0.56733	0.00628	0.43443
D2	0.75631	0.57200	0.00467	-0.00168
OBSE	0.75914	0.57629	0.00429	0.30116
PICTIME	0.76203	0.58070	0.00440	-0.18507
D4	0.76488	0.58504	0.00434	0.21090
WRAA	0.76878	0.59102	0.00598	0.44334
CONHYP	0.77137	0.59501	0.00399	-0.21463
D5	0.77435	0.59962	0.00461	-0.20410
OBSA	0.77714	0.60395	0.00433	-0.13543
OBSB	0.77854	0.60612	0.00217	0.15965
SESFAM	0.78012	0.60858	0.00246	0.06241
OBSF	0.78129	0.61042	0.00184	0.22745
CONANX	0.78266	0.61256	0.00214	0.07231
CIR7TOT	0.78374	0.61425	0.00169	0.48752
OBSC	0.78506	0.61632	0.00207	0.25512
CIR9TOT	0.78627	0.61821	0.00190	0.31464
OBSH	0.78755	0.62023	0.00202	0.29908
OBSD	0.78842	0.62161	0.00138	0.10866
TPBTOTAL	0.78949	0.62329	0.00168	-0.00183
PEABIQ	0.79008	0.62423	0.00094	0.29254
CIR5TOT	0.79061	0.62506	0.00083	0.30573
PERSOC	0.79120	0.62599	0.00093	0.33115
PICERR	0.79179	0.62694	0.00095	-0.28944
OBSJ	0.79220	0.62758	0.00064	0.30048
WRAS	0.79274	0.62843	0.00085	0.42955
OBSI	0.79313	0.62905	0.00061	0.21060
RENINF	0.79327	0.62928	0.00024	0.11198
(CONSTANT)				

garten predictors were included in the multiple regression yielded a multiple correlation of .79 accounting for 63% of the variance in raw scores on the Rendement en Français, F(39,76)=3.308, $p < .01$. Nonverbal IQ (MATRS) was the best single predictor accounting for 31% of the variance. Fifty per cent of the variance could be accounted for on the basis of six predictor variables: nonverbal IQ (MATRS), reading readiness (WPAA), ratings of auditory comprehension, conduct problems and inattentive-passive behavior (AUDCOMP, CONPROB, CONPASS), and age.

Simple correlations between raw scores on the Test de Rendement en Français and the five-year-old kindergarten predictors are presented in Table 43. The measure of reading achievement in French correlated most highly with measures of academic achievement in reading, spelling and arithmetic in English (XWRARG, XWRASG, XWRAAG), knowledge of numbers in French (XFWRAA), English receptive vocabulary skills (XPEABIQ), and French Comprehension Test scores at the kindergarten level (XFRCOMPR). Other measures correlated with the Rendement en Français ($r \geq .25$) were the memory component of the Tactual Performance Test, readiness measures of listening comprehension and problem-solving in English (XCIR9T, XCIR13T), and ratings of inattentive-passive behavior, performance rate, manual dexterity and self-confidence.

The results of the stepwise multiple regression analysis of five-year-old kindergarten predictors and the Rendement en Français criterion variable are presented in Table 47. Thirty-one of the 34 variables combined to yield a multiple correlation of 75 accounting for 57% of the variance in scores on the criterion, $F(31,84)=3.359$, $p<.01$. The best single predictor, academic achievement in English reading (XWRARG), accounted for 19% of the variance. Fifty per cent of the variance in scores on the Rendement en Français could be accounted for on the basis of ten predictors which included academic achievement in English reading, French comprehension, English receptive vocabulary skills, knowledge of numbers in French, the memory component of the Tactual Performance Test, sex, and ratings of conduct problems, manual dexterity, and amount of motor activity.

The Test de Rendement en Français, Level One, is a measure of reading skills in French. Reading skills

TABLE 47

Results of the Multiple Linear Regression Analysis of The Test de Rendement en Francais, Level One, and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YRENDR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XWRARG	0.44036	0.19392	0.19392	0.44036
XFRCOMPR	0.55423	0.30718	0.11326	0.36396
XPEABIQ	0.61527	0.37856	0.07138	0.40624
XOBSC	0.64979	0.42222	0.04366	0.32473
XMEM	0.66558	0.44300	0.02078	0.29828
XCONCP	0.67897	0.46100	0.01800	-0.09221
XOBSA	0.68980	0.47582	0.01482	0.02220
D1	0.69935	0.48910	0.01327	0.09291
XFWRAA	0.70453	0.49636	0.00727	0.39954
D3	0.70887	0.50250	0.00614	-0.02055
XWRASG	0.71303	0.50841	0.00591	0.40424
XFWRAR	0.71565	0.51215	0.00374	0.12834
XOBSI	0.71807	0.51563	0.00348	0.19676
XOBSF	0.72353	0.52349	0.00786	0.22912
XOBSG	0.72953	0.53221	0.00872	0.26854
XOBSD	0.73293	0.53719	0.00498	0.21825
XCIR13T	0.73643	0.54232	0.00513	0.32462
XOBSE	0.73829	0.54507	0.00275	0.16138
XRENINF	0.74042	0.54821	0.00314	0.15510
XRENGRM	0.74467	0.55454	0.00633	0.18478
XOBSJ	0.74701	0.55803	0.00349	0.16114
XCIR9T	0.74846	0.56019	0.00217	0.29259
XCONTA	0.74965	0.56198	0.00178	-0.06763
XAGE	0.75085	0.56378	0.00180	0.03947
XTOTTPB	0.75158	0.56488	0.00110	-0.19131
XWRAAG	0.75203	0.56555	0.00067	0.38971
XCONHY	0.75238	0.56607	0.00053	-0.13424
XCONIP	0.75315	0.56723	0.00116	-0.28028
XSEGSYL	0.75330	0.56746	0.00023	0.10622
D2	0.75342	0.56764	0.00018	0.09227
XOBSB	0.75347	0.56771	0.00007	0.43853
(CONSTANT)				

in English assessed in four- and five-year-old kindergarten were among the best ten predictors of French reading skills. This indicates a transfer of knowledge from the native language to the second language. The teachers' rating of conduct problems was also among the ten best predictors of achievement in French reading at both levels. The Tactual Performance Test was included in the multiple regression analyses. However, it was entered on step 23 for the four-year-old kindergarten predictors and on step 25 for the five-year-old kindergarten predictors. The Tactual Performance Test appears to be more highly related to French comprehension than to French reading.

Peabody Picture Vocabulary Test (French): Simple correlations between this measure of receptive vocabulary skills in French and the four-year-old kindergarten predictor variables (see Table 42) indicated that it was most highly correlated ($r \geq .25$) with IQ (FSIQ), auditory discrimination ability (CIR7TOT), receptive vocabulary skills in English (PEABIQ), knowledge of quantitative concepts (CIR2TOT), problem-solving ability (CIR13TOT) and behavior ratings of conduct problems and inattentive-passive behavior (CONPROB, CONPASS).

The results of the stepwise multiple regression analysis of the four-year-old kindergarten predictors and the Peabody Picture Vocabulary Test (French) are presented in Table 48. Forty of the 43 four-year-old kindergarten predictors were included in the multiple regression yielding a multiple correlation of .69 accounting for 48% of the variance in French Peabody IQ scores, $F(40,75)=1.694$, $p < .05$. IQ (FSIQ) was the best single predictor accounting for 13% of the variance. Thus, the four-year-old kindergarten measures had low predictive validity in relation to this measure of French vocabulary. The French Peabody is a direct translation of the English version and may not be a reliable measure of vocabulary skills in French.

Simple correlations between the French Peabody and the five-year-old kindergarten predictors (see Table 43) indicated that French vocabulary skills were most highly related to measures of English vocabulary skills (XPEABIQ), French comprehension (XFRCOMPR), listening comprehension in English (XCIP13T), and ratings of inattentive-passive

TABLE 48

Results of the Multiple Linear Regression Analysis of The Peabody Picture Vocabulary Test (French) and the Four-Year-Old Kindergarten Predictors

Dependent Variable.. YFRPEAIQ
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
FSIQ	0.35708	0.12751	0.12751	0.35708
CONPROB	0.41157	0.16939	0.04188	-0.27680
AGE	0.45799	0.20975	0.04037	0.10953
WRAS	0.50473	0.25475	0.04500	0.07244
OBSA	0.52009	0.27049	0.01574	-0.23923
ORIEN	0.53767	0.28909	0.01860	0.17164
OBSI	0.55384	0.30674	0.01765	0.01820
CIR5TOT	0.56468	0.31887	0.01212	0.07908
CIR7TOT	0.58486	0.34207	0.02320	0.32629
RENGRAM	0.59145	0.34981	0.00774	0.08059
CONPASS	0.59778	0.35735	0.00754	-0.27966
PERSOC	0.61262	0.37531	0.01796	0.23322
OBSE	0.61969	0.38402	0.00871	0.19055
AUDCOMP	0.62472	0.39027	0.00626	0.20116
D4	0.63085	0.39797	0.00770	-0.00775
OBSD	0.63557	0.40395	0.00597	0.00746
OBSG	0.64074	0.41055	0.00660	0.11269
SESFAM	0.64516	0.41624	0.00569	0.03823
CIR13TOT	0.64893	0.42111	0.00487	0.25700
CIR3TOT	0.65306	0.42649	0.00539	0.20396
OBSH	0.65745	0.43223	0.00574	0.13577
OBSC	0.66229	0.43863	0.00639	0.06875
PEABIQ	0.66752	0.44558	0.00695	0.26952
D2	0.67005	0.44897	0.00339	-0.03320
WRAA	0.67245	0.45219	0.00321	0.21234
CIR2TOT	0.67450	0.45494	0.00276	0.24720
WRAR	0.67708	0.45844	0.00350	0.04790
OBSF	0.67883	0.46082	0.00238	0.06977
MOTCOR	0.68071	0.46337	0.00255	0.12625
TPBTOTAL	0.68274	0.46614	0.00277	-0.01622
OBSJ	0.68426	0.46821	0.00207	0.17328
PICTIME	0.68526	0.46958	0.00137	-0.16916
MATRS	0.68627	0.47097	0.00139	0.24190
OBSB	0.68727	0.47233	0.00136	0.10244
RENINF	0.68767	0.47289	0.00056	0.05267
SYLTOT	0.68798	0.47332	0.00043	0.00098
D1	0.68823	0.47366	0.00034	0.05093
CONHYP	0.68854	0.47408	0.00042	-0.21652
CONANX	0.68884	0.47450	0.00042	-0.14103
SPOKLAN	0.68897	0.47468	0.00018	0.18723
(CONSTANT)				

behavior (XCONIP).

Results of the multiple regression analysis of five-year-old kindergarten predictors and the French Peabody criterion measure are presented in Table 49. Thirty of the 34 variables were included in the multiple regression which yielded a multiple correlation of .66 accounting for 44% of the variance in French Peabody IQ scores, F(30,85)= 2.178, $p < .01$. The best single predictor was the English version of the Peabody (XPEABIQ) which accounted for 14% of the variance.

Thus, four-year-old kindergarten and five-year-old kindergarten predictors accounted for less than 50% of the variance in French receptive vocabulary skills measured by the French translation of the Peabody Picture Vocabulary Test. The items on this test are direct translations of the English items and the level of difficulty of the French vocabulary items is not controlled. The IQ norms are based upon the progressive difficulty of the English vocabulary items and may not be appropriate indications of French receptive vocabulary skills. In addition, variations in performance at the low end of

TABLE 49

Results of the Multiple Linear Regression Analysis of The Peabody Picture Vocabulary Test (French) and the Five-Year-Old Kindergarten Predictors

Dependent Variable.. YFRPEAIQ
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XPEABIQ	0.36850	0.13579	0.13579	0.36850
XFRCOMPR	0.45399	0.20610	0.07032	0.31523
XFWRAR	0.50223	0.25224	0.04613	-0.09019
XCONHY	0.53240	0.28345	0.03121	-0.21470
XOBSI	0.55601	0.30915	0.02570	-0.07710
XAGE	0.56595	0.32030	0.01115	-0.03915
XRENGRM	0.57661	0.33248	0.01217	0.17106
XLOC	0.58389	0.34092	0.00845	0.11995
XOBSE	0.58967	0.34771	0.00679	0.01830
XOBSA	0.59648	0.35578	0.00807	-0.00008
XWRASG	0.60152	0.36182	0.00604	0.12768
XCIR9T	0.60664	0.36802	0.00619	0.13188
XCONIP	0.61123	0.37360	0.00558	-0.28697
XCONTA	0.62273	0.38779	0.01419	0.03549
XWRARG	0.62727	0.39347	0.00568	0.05358
XOBSH	0.63078	0.39789	0.00442	0.04111
XOBSC	0.63416	0.40215	0.00427	0.01102
XTOTTPB	0.63700	0.40577	0.00362	-0.07338
XOBSF	0.63944	0.40888	0.00311	0.14165
XOBSD	0.64486	0.41585	0.00697	0.03894
XMEM	0.64858	0.42066	0.00481	0.14945
XOBSG	0.65216	0.42532	0.00466	0.06954
XOBSJ	0.65466	0.42858	0.00327	-0.05507
D2	0.65635	0.43080	0.00221	0.04835
XRENINF	0.65745	0.43224	0.00145	0.12174
XPICTIM	0.65817	0.43318	0.00094	0.08823
XCONCP	0.65855	0.43369	0.00051	-0.12183
XCIR13T	0.65882	0.43405	0.00035	0.25024
XOBSB	0.65914	0.43447	0.00042	0.12307
XWRAAG	0.65926	0.43462	0.00015	0.18666
(CONSTANT)				

the scale were obscured by the lack of variation in available IQ scores. For example, all raw scores below 40 were assigned an IQ of 55, which was the lowest IQ score provided in the English norms. At both the four- and five-year-old kindergarten levels, age, ratings of motor activity and cooperation, expressive language skills in English (grammar) and WRAT spelling scores were among the best predictors. French Comprehension Test scores in five-year-old kindergarten were related to this measure of receptive vocabulary skills and indicate that it has some validity as a measure of French language skills. However, the correlation between these measures was not extremely high (r=.32). The Tactual Performance Test was entered in the multiple regression of the four-year-old kindergarten predictors (step 30) and of the five-year-old kindergarten predictors (step 18) but it explained only a small proportion of the variance in French receptive vocabulary scores.

Knowledge of the Alphabet in French: Simple correlations between knowledge of the alphabet in French and four-year-old kindergarten predictors (see Table 42) indicated that this measure was most highly correlated with teacher ratings of auditory comprehension (AUDCOMP), motor coordination (MOTCOR), inattentive-passive and personal-social behavior (PERSOC), and reading and arithmetic readiness skills in English (WRAR, WRAS, CIR2TOT, CIR5TOT).

The results of a stepwise multiple regression analysis of the four-year-old kindergarten measures and knowledge of the French alphabet are presented in Table 50. Thirty-eight of the 43 predictors combined to yield a multiple correlation of .65 accounting for 43% of the variance, $F(38,84)=2.178$, $p < .01$. The teachers' rating of motor coordination was the best single predictor accounting for 9% of the variance. Readiness measures of quantitative concepts of knowledge of letters and numbers in English and of auditory discrimination, word segmenting ability and nonverbal IQ were among the ten best predictors. This indicates the importance of the child's attentiveness to the speech signal and to symbols, and of the ability to retain verbal and nonverbal concepts.

Simple correlations between knowledge of the alphabet in French and five-year-old kindergarten measures

TABLE 50

Results of the Multiple Linear Regression Analysis of Knowledge of the Alphabet in French and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YFWRAR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
MOTCOR	0.29444	0.08669	0.08669	0.29444
CIR5TOT	0.37031	0.13713	0.05043	0.26959
MATRS	0.41019	0.16825	0.03112	-0.05619
SYLTOT	0.44946	0.20202	0.03376	0.22111
CIR2TOT	0.47921	0.22965	0.02763	0.27359
OBSA	0.50670	0.25674	0.02710	-0.24144
OBSF	0.52865	0.27947	0.02273	-0.00862
CIR7TOT	0.54376	0.29567	0.01620	0.12529
PERSOC	0.55782	0.31116	0.01549	0.28015
ORIEN	0.56489	0.31910	0.00793	0.12062
CONANX	0.57029	0.32523	0.00613	-0.05859
WRAR	0.57571	0.33144	0.00621	0.24004
SPOKLAN	0.58066	0.33716	0.00572	0.23253
AGE	0.58614	0.34356	0.00640	0.13706
CONHYP	0.58972	0.34777	0.00421	-0.23305
D3	0.59330	0.35201	0.00424	0.10206
PICERR	0.59768	0.35722	0.00521	-0.06483
OBSE	0.60250	0.36300	0.00578	0.12850
D4	0.60760	0.36918	0.00618	0.03854
AUDCOMP	0.61245	0.37510	0.00592	0.27214
OBSH	0.61679	0.38043	0.00533	0.13914
WRAA	0.61954	0.38383	0.00340	0.24664
RENGRAM	0.62195	0.38682	0.00299	-0.03016
RENINF	0.63136	0.39862	0.01180	0.06248
OBSJ	0.63436	0.40241	0.00379	0.07632
TPBTOTAL	0.63732	0.40618	0.00377	0.02788
D2	0.64085	0.41069	0.00451	0.01978
OBSD	0.64278	0.41317	0.00248	-0.08267
SESFAM	0.64446	0.41533	0.00216	0.05701
OBSG	0.64617	0.41753	0.00220	-0.03672
CONPROB	0.64733	0.41904	0.00151	-0.08831
OBSB	0.64826	0.42024	0.00120	-0.01957
FSIQ	0.64929	0.42158	0.00134	0.15204
PEABIQ	0.65097	0.42376	0.00218	-0.02115
CIR9TOT	0.65225	0.42543	0.00167	0.12357
CONPASS	0.65281	0.42617	0.00074	-0.26548
OBSC	0.65298	0.42639	0.00022	0.09949
D5	0.65306	0.42648	0.00010	-0.11146
(CONSTANT)				

(see Table 43) indicated that knowledge of alphabetic characters in French was mostly highly correlated ($r \geq .25$) with academic achievement in spelling and arithmetic in English (XWRASG, XWRAAG) and ratings of inattentive-passive behavior (XCONIP).

The results of the stepwise multiple regression analysis of five-year-old kindergarten measures and the criterion measure of knowledge of the alphabet in French are presented in Table 51. Thirty-one of the 34 five-year-old kindergarten predictors combined to yield a multiple correlation of .68 which accounted for 46% of the variance, ($F(31,84=2.346$, $p < .05$. The teachers' ratings of inattentive-passive behavior was the best single predictor accounting for 23% of the variance.

Less than 50% of the variance in knowledge of the alphabet in French could be accounted for on the basis of four-year-old kindergarten and five-year-old kindergarten predictors. There was no overlap among the ten best predictors at the two kindergarten levels. Readiness skills of quantitative concepts, knowledge of numbers and letters and auditory discrimination, and behavior ratings

TABLE 51

Results of the Multiple Linear Regression Analysis of Knowledge of the Alphabet in French and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YFWRAR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XCONIP	0.47447	0.22512	0.22512	-0.47447
XWRAAG	0.52545	0.27610	0.05098	0.38367
XPEABIQ	0.57110	0.32615	0.05005	0.01120
XOBSG	0.58780	0.34550	0.01935	-0.00108
XOBSJ	0.60302	0.36363	0.01813	0.11278
XLOC	0.61281	0.37554	0.01191	-0.11165
XFWRAR	0.62376	0.38907	0.01354	0.22316
XCIR13T	0.63056	0.39761	0.00854	0.11979
XCIR9T	0.63649	0.40512	0.00750	0.22362
XFRCOMPR	0.64311	0.41360	0.00848	0.07545
XCONCP	0.64859	0.42068	0.00708	-0.13128
D1	0.65285	0.42621	0.00554	-0.06668
XTOTTPB	0.65728	0.43202	0.00580	0.04906
XOBSH	0.66165	0.43778	0.00576	0.11091
XRENGRM	0.66593	0.44347	0.00569	0.15653
XOBSB	0.66890	0.44742	0.00395	0.15716
D3	0.67130	0.45064	0.00322	0.10226
XMEM	0.67393	0.45418	0.00354	0.02550
XOBSC	0.67601	0.45700	0.00281	0.11244
XCONHY	0.67714	0.45852	0.00152	-0.20706
XSEGSYL	0.67783	0.45946	0.00094	0.13478
XWRARG	0.67852	0.46040	0.00094	0.16903
XOBSE	0.67908	0.46115	0.00075	0.20388
XPICTIM	0.67954	0.46177	0.00062	0.01867
XFWRAA	0.67997	0.46236	0.00059	0.20562
XWRASG	0.68031	0.46282	0.00046	0.25109
D2	0.68068	0.46333	0.00050	0.16619
XOBSA	0.68083	0.46353	0.00020	0.08079
XOBSF	0.68098	0.46373	0.00020	0.05360
XRENINF	0.68109	0.46388	0.00015	0.13794
XCONTA	0.68117	0.46399	0.00011	-0.09580
(CONSTANT)				

of motor coordination, amount of motor activity, anxiety, personal-social behavior and orientation were important at the four-year-old kindergarten level. Academic achievement in English, readiness skills of listening comprehension and problem-solving, and behavior ratings of inattentive-passive behavior, self-confidence and interest were important at the five-year-old kindergarten level. The five-year-old kindergarten Tactual Performance Test (entered on step 13) was a more important predictor of knowledge of the alphabet in French than was the four-year-old kindergarten Tactual Performance Test (entered on step 26).

Knowledge of Numbers in French: Simple correlations between the four-year-old kindergarten measures and knowledge of numbers in French (see Table 42) indicated that this measure was most highly correlated with teachers' ratings of hyperactivity and English language skills (CONHYP, AUDCOMP, SPOKLAN), reading and arithmetic readiness skills in English (WRAR, WRAA, CIR2TOT, CIR5TOT), picture-naming in English (PICERR), FSIQ and the Tactual Performance Test (TPBTOTAL).

The results of the stepwise multiple regression analysis of four-year-old kindergarten measures and the criterion measure of knowledge of numbers in French are presented in Table 52. Forty-two of the 43 variables combined to yield a multiple correlation of .74 accounting for 55% of the variance, $F(42,73)=2.163$, $p < .01$. Teachers' ratings of hyperactivity (CONHYP) was the best single predictor accounting for 14% of the variance. A combination of ratings of hyperactivity, spoken language, personal-social behavior, interest, and amount of speech together with Tactual Performance Test scores, picture-naming in English and arithmetic readiness accounted for 40% of the variance. Simple correlations between knowledge of numbers in French and five-year-old kindergarten measures (see Table 42) indicated high correlations between this measure of French language achievement and knowledge of the alphabet in French at the five-year-old kindergarten level (XFWRAR), English spelling skills (XWRASG), ratings of inattentive-passive behavior and hyperactivity, performance rate and problem-solving skills (XCIR13T).

The results of the stepwise multiple regression analysis of the five-year-old kindergarten measures and the

TABLE 52

Results of the Multiple Linear Regression Analysis of Knowledge of Numbers in French and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YFWRAA
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
CONHYP	0.37570	0.14115	0.14115	-0.37570
SPOKLAN	0.46834	0.21934	0.07818	0.35134
PERSOC	0.52524	0.27588	0.05654	0.21287
TPBTOTAL	0.57417	0.32967	0.05379	-0.26290
PICERR	0.59651	0.35583	0.02616	-0.26983
OBSJ	0.60873	0.37055	0.01472	-0.02865
WRAA	0.62116	0.38584	0.01529	0.27684
OBSD	0.63420	0.40221	0.01637	0.16065
OBSE	0.64309	0.41357	0.01136	0.09647
AGE	0.64800	0.41990	0.00633	-0.08711
FSIQ	0.65627	0.43069	0.01079	0.28822
RENINF	0.66223	0.43855	0.00786	0.15390
ORIEN	0.66935	0.44802	0.00947	0.10753
CIR13TOT	0.67490	0.45549	0.00747	0.22666
SYLTOT	0.67883	0.46081	0.00532	0.02561
OBSA	0.68325	0.46683	0.00602	-0.09689
OBSB	0.68754	0.47271	0.00588	0.01981
CIR2TOT	0.69298	0.48022	0.00751	0.31903
OBSC	0.69694	0.48573	0.00551	-0.05974
OBSI	0.70068	0.49096	0.00522	-0.06352
OBSH	0.70531	0.49746	0.00651	0.01293
PICTIME	0.71188	0.50678	0.00931	-0.15172
CIR7TOT	0.71699	0.51408	0.00730	0.22929
MATRS	0.72073	0.51945	0.00537	0.11699
WRAR	0.72648	0.52777	0.00832	0.28892
D1	0.72983	0.53265	0.00488	-0.12785
D2	0.73183	0.53558	0.00292	0.08895
D5	0.73449	0.53948	0.00390	-0.19396
OBSG	0.73660	0.54258	0.00311	-0.05901
AUDCOMP	0.73808	0.54476	0.00217	0.29931
CONPASS	0.73925	0.54649	0.00173	-0.21106
SESFAM	0.74018	0.54786	0.00137	0.07297
RENGRAM	0.74085	0.54886	0.00100	0.19733
OBSF	0.74143	0.54972	0.00085	0.09899
MOTCOR	0.74212	0.55074	0.00103	0.11508
CONANX	0.74267	0.55156	0.00082	0.14056
CIR9TOT	0.74305	0.55213	0.00056	0.13574
CONPROB	0.74340	0.55265	0.00052	-0.17524
D4	0.74367	0.55304	0.00039	0.13450
PEABIQ	0.74405	0.55361	0.00057	0.19392
WRAS	0.74435	0.55406	0.00044	0.18790
D3	0.74464	0.55449	0.00043	0.06913
(CONSTANT)				

knowledge of numbers in French are presented in Table 53. Thirty of the 34 predictors combined to yield a multiple correlation of .63 accounting for 40% of the variance, $F(30,85)=1.887$, $p < .01$. Academic achievement in reading in English (XFWRAR) was the best single predictor accounting for 13% of the variance.

Prediction of knowledge of numbers in French at the grade one level was better on the basis of the four-year-old kindergarten predictors than on the basis of the five-year-old kindergarten predictors. At both kindergarten levels, ratings of hyperactivity and interest and WRAT arithmetic scores measured in English were among the ten best predictors of this criterion measure of French achievement. At the four-year-old kindergarten level, the Tactual Performance Test was also important. Thus, if the child shows good problem-solving ability in four-year-old kindergarten and has a good knowledge of numbers in English, then he is likely to acquire a good knowledge of numbers in the French language.

Picture-naming in French (Time): Simple correlations computed between this measure of expressive

TABLE 53

Results of the Multiple Linear Regression Analysis of Knowledge of Numbers in French and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YFWRAA
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XFWRAR	0.35862	0.12861	0.12861	0.35862
XCONIP	0.45360	0.20575	0.07715	-0.29979
XWRASG	0.48893	0.23905	0.03330	0.33268
XOBSC	0.52375	0.27431	0.03526	-0.05710
XCONHY	0.54252	0.29432	0.02001	-0.29546
XPICTIM	0.55189	0.30458	0.01026	0.08865
XCIR13T	0.55988	0.31347	0.00889	0.29089
XWRAAG	0.56754	0.32210	0.00863	0.23958
XOBSG	0.57465	0.33023	0.00813	0.21303
XOBSJ	0.58617	0.34360	0.01337	0.00131
XLOC	0.59393	0.35275	0.00915	0.02226
XPEABIQ	0.60260	0.36313	0.01038	0.20315
XMEM	0.60780	0.36942	0.00630	0.10265
XCONTA	0.61270	0.37540	0.00598	0.09052
XOBSA	0.61524	0.37851	0.00311	0.14709
XFRCOMPR	0.61751	0.38131	0.00280	0.22887
D3	0.61939	0.38364	0.00233	0.07086
XOBSE	0.62118	0.38586	0.00222	0.16123
XOBSB	0.62305	0.38819	0.00233	0.24980
XOBSD	0.62603	0.39192	0.00372	0.03591
XOBSF	0.62766	0.39396	0.00204	0.11149
XCIR9T	0.62913	0.39581	0.00185	0.17121
XRENGRM	0.63013	0.39706	0.00125	0.06168
XTOTTPB	0.63085	0.39797	0.00091	-0.05209
XRENINF	0.63116	0.39837	0.00040	0.04896
XFWRAA	0.63149	0.39878	0.00041	0.15869
XOBSI	0.63178	0.39914	0.00037	0.00114
D1	0.63196	0.39938	0.00023	-0.09406
XOBSH	0.63213	0.39959	0.00021	0.14578
XWRARG	0.63231	0.39981	0.00022	0.19773
(CONSTANT)				

vocabulary skills in French and the four-year-old kindergarten measures (see Table 42) indicated that it was most highly correlated with FSIQ, picture-naming in English and the teachers' advice against French immersion enrolment (D5).

The results of the stepwise multiple regression analysis of four-year-old kindergarten predictors and picture-naming in French (time) are presented in Table 54. Thirty-eight of the 43 variables combined to yield a multiple correlation of .74 accounting for 54% of the variance, $F(38,77)=2.409$, $p < .01$. FSIQ was the best single predictor accounting for 9% of the variance. A combination of 20 predictors accounted for 50% of the variance. These included IQ (FSIQ, MATRS), teachers' advice regarding French immersion enrolment, knowledge of quantitative concepts in English, picture-naming in English, age, English language skills, SES, auditory comprehension, attention, effort, interest, cooperation and inattentive-passive behavior.

Simple correlations between picture-naming in French (time) and five-year-old kindergarten measures

TABLE 54

Results of the Multiple Linear Regression Analysis of Picture-Naming in French (Time) and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YPICTIM
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
FSIQ	0.30285	0.09172	0.09172	0.30285
D5	0.35956	0.12928	0.03756	-0.25831
CIR2TOT	0.42437	0.18009	0.05081	0.04429
PICERR	0.48618	0.23637	0.05628	-0.26468
D4	0.53486	0.28608	0.04971	-0.01004
MOTCOR	0.57175	0.32690	0.04082	-0.03141
AUDCOMP	0.59815	0.35779	0.03089	0.21053
OBSE	0.61393	0.37691	0.01913	-0.09129
AGE	0.63487	0.40306	0.02614	0.06037
MATRS	0.64953	0.42189	0.01883	0.00625
PICTIME	0.65972	0.43522	0.01333	-0.20923
PEABIQ	0.66493	0.44213	0.00690	0.23494
RENGRAM	0.66915	0.44776	0.00564	0.10388
RENINF	0.67643	0.45755	0.00979	0.15856
SESFAM	0.68122	0.46406	0.00650	-0.02535
OBSH	0.68543	0.46981	0.00575	-0.07750
OBSJ	0.69315	0.48046	0.01065	0.05258
CIR7TOT	0.69789	0.48705	0.00659	0.21534
OBSI	0.70346	0.49486	0.00781	-0.00788
CONPASS	0.70995	0.50402	0.00916	-0.01107
OBSF	0.71193	0.50684	0.00282	0.02349
CONANX	0.71438	0.51034	0.00350	0.04868
CONPROB	0.71681	0.51382	0.00348	0.05195
CIR13TOT	0.71901	0.51697	0.00315	0.20427
WRAA	0.72107	0.51994	0.00297	0.12998
CIR5TOT	0.72333	0.52321	0.00327	0.00681
CONHYP	0.72503	0.52567	0.00246	-0.09983
PERSOC	0.72773	0.52958	0.00391	0.08024
OBSC	0.72998	0.53287	0.00328	-0.03787
ORIEN	0.73211	0.53599	0.00312	0.05065
SPOKLAN	0.73360	0.53817	0.00218	0.15273
CIR9TOT	0.73489	0.54007	0.00190	0.05152
D3	0.73558	0.54109	0.00101	0.09169
SYLTOT	0.73639	0.54228	0.00119	0.06059
WRAR	0.73662	0.54261	0.00034	0.10578
OBSD	0.73678	0.54285	0.00024	0.20144
D2	0.73690	0.54303	0.00017	0.02570
TPBTOTAL	0.73695	0.54309	0.00007	-0.02597
(CONSTANT)				

(see Table 43) indicated that this measure of French achievement correlated highly with only one variable, English receptive vocabulary skills.

The results of the stepwise multiple regression analysis of five-year-old kindergarten measures and picture-naming in French (time) are presented in Table 55. Thirty of the 34 predictors combined to yield a multiple correlation of .61 accounting for 38% of the variance, F(30,85)= 1.700, $p < .05$. Receptive vocabulary skills in English (XPEABIQ) was the best single predictor accounting for 9% of the variance.

Again, better prediction of picture-naming in French (time) was achieved on the basis of four-year-old kindergarten predictors. At both kindergarten levels, age was an important predictor of achievement. The four-year-old kindergarten teachers' advice regarding French immersion enrolment, IQ measures, and behavior ratings and performance on the English picture-naming test were important predictors of this measure of expressive French language skills.

Picture-naming in French (errors): Simple

TABLE 55

Results of the Multiple Linear Regression Analysis of Picture-Naming in French (Time) and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YPICTIM
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XPEABIQ	0.30638	0.09387	0.09387	0.30638
XFWRAR	0.35755	0.12784	0.03397	0.21906
XOBSC	0.38349	0.14707	0.01922	-0.07783
XOBSH	0.41688	0.17379	0.02672	0.21218
XSEGSYL	0.43427	0.18859	0.01481	-0.06443
XPICTIM	0.45009	0.20258	0.01398	0.18607
XOBSB	0.47522	0.22583	0.02325	0.18052
XRENINF	0.48903	0.23915	0.01332	0.10534
XCONHY	0.50062	0.25062	0.01147	0.02691
XAGE	0.51352	0.26371	0.01309	-0.11063
XTOTTPB	0.52402	0.27460	0.01089	0.04602
XOBSA	0.53720	0.28859	0.01399	-0.05684
XCONTA	0.54617	0.29830	0.00972	0.10702
XCIR9T	0.55694	0.31019	0.01189	0.17802
XOBSF	0.56298	0.31695	0.00676	0.16407
XOBSJ	0.57551	0.33121	0.01426	0.04709
XRENGRM	0.58281	0.33966	0.00846	0.04830
XWRASG	0.58843	0.34625	0.00659	0.12224
XOBSI	0.59230	0.35082	0.00456	0.01547
XOBSE	0.59580	0.35498	0.00416	0.07239
XCONIP	0.59886	0.35864	0.00366	-0.00319
XLOC	0.60135	0.36163	0.00299	0.08659
XMEM	0.60566	0.36682	0.00519	0.00243
XCONCP	0.60892	0.37078	0.00396	0.03848
XWRARG	0.61082	0.37311	0.00233	0.09541
XWRAAG	0.61138	0.37379	0.00068	0.21754
D1	0.61199	0.37454	0.00075	-0.06644
XFWRAA	0.61210	0.37467	0.00013	0.00320
XFRCOMPR	0.61225	0.37485	0.00018	0.18313
D2	0.61237	0.37500	0.00015	-0.05676
(CONSTANT)				

correlations with four-year-old kindergarten measures (see Table 42) indicated that this measure of expressive vocabulary skills in French was most highly correlated with arithmetic readiness skills in English (WRAA, CIR2TOT), auditory discrimination (CIR7TOT), ratings of inattentive-passive behavior (CONPASS) and self-confidence, English language skills (PEABIQ, RENINF, PICERR) and IQ.

The results of the stepwise multiple regression analysis of four-year-old kindergarten measures and picture-naming in French (errors) are presented in Table 56. Forty-one of the 43 predictors combined to yield a multiple correlation of .68 accounting for 46% of the variance, F(41,74)=1.537. $p < .05$. Arithmetic readiness skills (WRAA) was the best single predictor accounting for 11% of the variance. Simple correlations with five-year-old kindergarten measures (see Table 43) indicated that picture-naming in French (errors) was most highly correlated with behavior ratings of inattentive-passive beahvior, hyperactivity, anxiety and self-confidence as well as French comprehension, reading skills in English and listening comprehension skills in English.

TABLE 56

Results of the Multiple Linear Regression Analysis of Picture-Naming in French (Errors) and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YPICERR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
WRAA	0.33145	0.10986	0.10986	0.33145
RENINF	0.40921	0.16745	0.05759	0.27979
CONPASS	0.45073	0.20316	0.03571	-0.29622
OBSG	0.47789	0.22838	0.02522	0.25514
MOTCOR	0.51147	0.26160	0.03322	0.02149
WRAR	0.53252	0.28357	0.02197	0.24553
D4	0.54902	0.30142	0.01785	0.01731
SESFAM	0.56124	0.31499	0.01357	-0.04449
PEABIQ	0.57542	0.33111	0.01612	0.26040
AGE	0.58590	0.34328	0.01217	0.21310
CONHYP	0.59879	0.35855	0.01527	-0.19306
D2	0.60961	0.37162	0.01307	0.05165
ORIEN	0.61649	0.38006	0.00844	0.13320
WRAS	0.62168	0.38648	0.00642	0.13575
PICERR	0.62703	0.39317	0.00669	-0.27290
SYLTOT	0.63192	0.39932	0.00616	0.05168
CIR5TOT	0.63589	0.40436	0.00503	0.19797
PERSOC	0.64138	0.41137	0.00701	0.22401
OBSC	0.64463	0.41555	0.00418	0.13339
D1	0.64740	0.41913	0.00358	-0.01777
FSIQ	0.65006	0.42257	0.00345	0.24886
TPBTOTAL	0.65253	0.42579	0.00322	-0.11218
OBSB	0.65440	0.42824	0.00245	0.20150
CIR2TOT	0.65628	0.43070	0.00246	0.31948
D5	0.65848	0.43360	0.00290	-0.09700
OBSD	0.66040	0.43612	0.00252	0.13674
CIR9TOT	0.66230	0.43864	0.00252	0.25256
MATRS	0.66400	0.44089	0.00225	0.17321
OBSH	0.66599	0.44354	0.00265	0.16428
CONANX	0.66861	0.44704	0.00350	-0.15403
OBSE	0.67056	0.44965	0.00261	0.24833
PICTIME	0.67174	0.45123	0.00158	-0.15945
OBSI	0.67318	0.45317	0.00194	0.21522
AUDCOMP	0.67444	0.45487	0.00170	0.24630
OBSA	0.67554	0.45635	0.00148	-0.06569
CIR7TOT	0.67625	0.45731	0.00096	0.31022
RENGRAM	0.67688	0.45817	0.00085	0.23713
D3	0.67742	0.45890	0.00073	0.13061
OBSF	0.67774	0.45933	0.00043	0.22795
OBSJ	0.67812	0.45985	0.00052	0.24415
CIR13TOT	0.67821	0.45997	0.00012	0.21556
(CONSTANT)				

The results of the stepwise multiple regression analysis of five-year-old kindergarten predictors and picture-naming in French (errors) are presented in Table 57. The 34 predictors combined to yield a multiple correlation of .70 accounting for 49% of the variance, $F(34,81)=2.307$, $p < .01$. The rating of inattentive-passive behavior was the best single predictor accounting for 14% of the variance.

Prediction of errors in picture-naming in French was poorer than prediction of time scores on this measure for the four-year-old kindergarten predictors. Five-year-old kindergarten measures were better predictors of errors than of time scores. However, less than 50% of the variance in errors in picture-naming could be accounted for by either set of kindergarten predictors. WRAT reading scores and teachers' ratings of inattentive-passive behavior were among the best predictors at both kindergarten levels. Tactual Performance Test scores were included in both multiple regression analyses, entering the analysis of four-year-old predictors at step 22 and entering the five-year-old kindergarten analysis at step 30.

TABLE 57

Results of the Multiple Linear Regression Analysis of Picture-Naming in French (Errors) and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YPICERR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XCONIP	0.37254	0.13879	0.13879	-0.37254
XFRCOMPR	0.46427	0.21554	0.07675	0.33239
XWRARG	0.49901	0.24901	0.03347	0.27730
XCONHY	0.52496	0.27559	0.02658	-0.30671
XSEGSYL	0.54977	0.30225	0.02666	-0.07925
XOBSG	0.57381	0.32926	0.02701	0.27555
XOBSB	0.59512	0.35416	0.02490	0.13882
XOBSF	0.60887	0.37072	0.01655	0.31864
XOBSI	0.62165	0.38644	0.01573	0.03501
XMEM	0.63290	0.40056	0.01411	0.17389
XLOC	0.65150	0.42445	0.02389	0.04051
D3	0.65751	0.43231	0.00787	0.13152
XFWRAA	0.66105	0.43699	0.00467	0.13883
XCONTA	0.66449	0.44154	0.00456	0.00116
XCIR9T	0.66820	0.44649	0.00495	0.28074
XOBSE	0.67122	0.45054	0.00405	0.16535
XRENGRM	0.67458	0.45506	0.00452	0.13496
XOBSH	0.67868	0.46060	0.00554	0.08413
XAGE	0.68144	0.46437	0.00376	0.07763
XOBSJ	0.68434	0.46832	0.00395	0.11390
XRENINF	0.68787	0.47316	0.00485	0.09162
XOBSA	0.69148	0.47815	0.00498	0.07100
XPICTIM	0.69281	0.47999	0.00184	0.12215
D2	0.69443	0.48223	0.00224	0.19671
XOBSC	0.69578	0.48411	0.00188	0.05250
XWRASG	0.69643	0.48502	0.00091	0.21767
XWRAAG	0.69718	0.48605	0.00103	0.21871
XFWRAR	0.69833	0.48766	0.00160	0.09295
D1	0.69894	0.48852	0.00086	-0.09056
XTOTTFB	0.69952	0.48932	0.00080	-0.00603
XCONCP	0.69989	0.48985	0.00053	-0.12808
XOBSD	0.70048	0.49067	0.00082	0.12488
XCIR13T	0.70110	0.49155	0.00088	0.15695
XPEABIQ	0.70143	0.49201	0.00046	0.20199
(CONSTANT)				

Predicting Academic Achievement Assessed in English at the Grade One Level

The predictive validity of the Early Identification Assessment Battery (four-year-old kindergarten) and of the five-year-old Kindergarten Follow-up Assessment Battery were assessed in terms of criterion measures administered in the English language at the end of the grade one French immersion program. The criterion measures included tests of receptive and reading vocabulary skills, expressive English language skills, and academic achievement in reading, spelling and arithmetic. Pearson product-moment correlations between the seven criterion variables and the 43 four-year-old kindergarten predictors are presented in Table 58. The Pearson product-moment correlations with the 34 five-year-old kindergarten predictors are presented in Table 59. The variable names corresponding to these abbreviations are included in Appendix II.

The predictive validity of the predictors at

TABLE 58

Pearson Product-Moment Correlations Computed Among the English Criterion Measures and Four-Year-Old Kindergarten Predictors

	YRENINF	YRENGRM	YPEABIQB	YPEABIQA	YWRARG	YWRASR	YWRAAR
AGE	0.00916	0.09965	0.10377	0.04513	0.08493	0.04746	0.11439
SESFAM	0.13820	0.08393	0.12023	0.02721	0.17061	0.17057	0.02847
FSIQ	0.22114	0.35949	0.45372	0.22088	0.41644	0.41324	0.33404
PEABIQ	-0.05392	0.13996	0.54477	0.09990	0.14828	0.17672	0.00272
MATRS	0.12944	0.19846	0.19872	0.12591	0.29767	0.18247	0.22405
WRAR	0.20547	0.29828	0.21292	0.15717	0.57898	0.63506	0.22474
WRAS	0.24562	0.30692	0.11578	0.10650	0.48902	0.46443	0.41388
WRAA	0.19254	0.38890	0.28328	0.22282	0.38176	0.32823	0.37122
PICTIME	-0.12697	-0.21373	-0.18133	0.01153	-0.14875	-0.14040	-0.16812
PICERR	-0.19034	-0.23380	-0.34250	-0.04446	-0.25763	-0.21015	-0.12185
SYLTOT	0.31220	0.35430	0.15545	0.07631	0.18580	0.17884	0.06247
OBSA	-0.06931	-0.17308	-0.04353	0.00690	-0.16894	-0.17946	-0.32566
OBSB	0.07702	0.23137	0.14111	0.06902	0.20455	0.19533	0.24603
OBSC	0.13085	0.23220	-0.05201	-0.00455	0.22357	0.18549	0.21602
OBSD	0.27527	0.23336	0.20403	0.09219	0.13863	0.16318	0.00824
OBSE	0.05903	0.15593	0.02547	0.11745	0.15392	0.08785	0.26370
OBSF	0.17475	0.24993	0.07693	0.11963	0.23948	0.23742	0.21543
OBSG	0.05671	0.22322	0.13772	0.05531	0.11155	0.13358	0.24779
OBSH	0.06966	0.16410	0.02655	0.07812	0.21504	0.15256	0.13306
OBSI	0.19878	0.28045	0.06586	0.00584	0.21169	0.24315	0.18616
OBSJ	0.15594	0.21435	0.07659	0.06367	0.16880	0.13213	0.24100
RENINF	0.26061	0.23874	0.14163	0.10089	0.07939	0.05362	0.04407
RENGRAM	0.16353	0.27139	0.19023	0.10215	0.10266	0.09285	0.07073
CONPROB	-0.01748	0.05015	0.02486	-0.00668	-0.09533	-0.11173	-0.11157
CONPASS	-0.18861	-0.23666	-0.16682	-0.00246	-0.15112	-0.09738	-0.25300
CONANX	-0.00231	-0.06666	-0.03191	0.12970	0.08813	0.06426	-0.07191
CONHYP	-0.05464	-0.03723	-0.12350	-0.06502	-0.13388	-0.17331	-0.22085
AUDCOMP	0.15687	0.32315	0.36879	0.13498	0.31693	0.26422	0.30480
SPOKLAN	0.16147	0.37406	0.38346	0.14117	0.37268	0.33762	0.39841
ORIEN	0.15500	-0.00893	0.09779	0.07713	0.17444	0.08049	0.06337
MOTCOR	0.18360	0.28930	0.09800	0.11356	0.29281	0.22633	0.41147
PERSOC	0.14709	0.16135	0.12818	-0.00593	0.26617	0.24285	0.32327
CIR2TOT	0.22935	0.36925	0.29329	0.20271	0.42203	0.37862	0.34278
CIR5TOT	0.23086	0.31638	0.19443	0.21253	0.34612	0.30682	0.17983
CIR7TOT	0.33503	0.41781	0.39537	0.20982	0.46173	0.41380	0.21355
CIR9TOT	0.03913	0.30325	0.31519	0.16729	0.25424	0.24905	0.24959
CIR13TOT	0.21298	0.43862	0.34883	0.19316	0.32055	0.32688	0.26042
TPBTOTAL	-0.18353	-0.10814	0.07428	-0.05168	-0.06596	-0.08836	-0.05570
D1	-0.16823	-0.17794	0.24914	-0.03036	-0.01852	-0.07417	-0.00800
D2	-0.05834	-0.11836	-0.12202	0.02723	0.06186	0.09201	-0.06232
D3	-0.03089	-0.02373	0.05392	-0.03634	0.06291	0.07771	0.05190
D4	0.14747	0.20290	0.13294	-0.04186	0.19820	0.18844	0.04370
D5	0.02184	-0.10791	-0.07434	-0.08481	-0.20118	-0.18231	-0.16686

TABLE 59

Pearson Product-Moment Correlations Computed Among the English Criterion Measures and Five-Year-Old Kindergarten Predictors

	YWRARG	YWRASR	YWRAAR	YRENINF	YRENGRM	YPEABIQB	YPEABIQA
XAGE	-0.13870	-0.04278	-0.12358	0.05283	0.02275	0.04742	-0.06388
XFRCOMPR	0.12625	0.11788	0.19613	-0.02830	0.05832	0.16609	0.15860
XPEABIQ	0.25129	0.26028	0.15361	0.00894	0.16250	0.68867	-0.03350
XRENINF	0.09774	0.11073	0.02765	0.18086	0.32050	0.19420	0.04598
XRENGRM	0.11351	0.14151	0.06612	0.18229	0.27094	0.21870	0.03717
XSEGSYL	0.20195	0.13058	0.09278	0.22639	0.18601	0.08766	-0.06699
XMEM	0.04651	0.02770	-0.09405	0.11173	0.17034	0.10991	0.05602
XLOC	-0.00577	0.03711	-0.04117	0.08717	0.06912	0.08267	-0.04735
XPICTIM	0.11295	0.15217	0.05677	0.05541	0.08518	0.11362	0.05931
XWRARG	0.78660	0.74121	0.12168	0.16942	0.16815	0.24626	0.18120
XWRASG	0.68997	0.61355	0.29920	0.20330	0.22313	0.20443	0.21003
XWRAAG	0.52816	0.42179	0.47769	0.03788	0.18660	0.32012	0.23803
XFWRAR	0.22008	0.19751	0.28089	0.08311	0.10617	0.04229	0.18545
XFWRAA	0.36042	0.32098	0.02222	0.04307	0.05091	0.12907	0.13236
XCIR9T	0.25797	0.15683	0.20474	0.01840	0.20278	0.34269	0.08645
XCIR13T	0.14701	0.18122	0.21325	0.10232	0.24670	0.31282	0.08730
XOBSA	0.15217	0.20598	-0.07966	0.11405	0.17248	0.13503	-0.05427
XOBSB	0.41198	0.43284	0.22470	0.17845	0.22320	0.39445	0.06138
XOBSC	0.22839	0.29717	0.13020	0.15104	0.19460	0.22386	0.07447
XOBSD	0.19347	0.21237	0.01343	0.08491	0.12382	0.21825	-0.02034
XOBSE	0.13206	0.09357	0.02054	0.16252	0.12406	-0.00162	0.03937
XOBSF	0.23162	0.33925	0.11070	0.19298	0.29920	0.26235	-0.09667
XOBSG	0.21972	0.21606	0.15616	0.25476	0.23842	0.16678	-0.11044
XOBSH	0.12111	0.20229	0.09043	0.12802	0.16472	0.07536	-0.12368
XOBSI	0.11388	0.19414	0.05446	0.21956	0.23379	0.04336	-0.19215
XOBSJ	0.15419	0.21993	0.05329	0.24600	0.25241	-0.03819	0.01502
XCONCP	-0.06132	-0.04342	-0.08765	-0.08905	0.00070	0.03101	-0.01074
XCONIP	-0.35672	-0.31283	-0.38654	-0.12409	-0.30721	-0.29966	-0.18391
XCONTA	-0.08960	-0.02965	-0.01875	-0.10936	-0.23222	-0.11657	-0.03596
XCONHY	-0.10557	-0.13826	-0.17272	-0.13837	-0.08944	-0.00233	-0.05696
XTOTTPB	-0.13148	-0.14910	-0.04774	0.02375	0.06559	-0.07486	0.07273
D1	-0.03232	-0.08459	-0.01746	-0.23930	-0.25158	0.26358	-0.03881
D2	0.11065	0.14714	0.02045	-0.02047	-0.03721	-0.05448	0.07352
D3	0.06995	0.08435	0.05075	-0.03747	-0.02785	0.05575	-0.03552

the two kindergarten levels were assessed separately in relation to each criterion variable in stepwise multiple linear regression analyses. The simple correlations and the results of the stepwise multiple regression analyses are discussed below.

Peabody Picture Vocabulary Test, Form B - Receptive Vocabulary: Simple correlations between this measure of receptive vocabulary skills in English and four-year-old kindergarten measures (see Table 58) indicated that this measure of English language skills was most highly correlated with English receptive vocabulary skills at the four-year-old kindergarten level, FSIQ, readiness measures of quantitative concepts, auditory discrimination, listening comprehension and problem-solving, arithmetic readiness skills, picture-naming, sex and ratings of auditory comprehension and spoken language in English.

The results of the stepwise multiple regression analysis of four-year-old kindergarten predictors and English receptive vocabulary skills are presented in Table 60. Thirty-nine of the 43 predictors combined to yield a multiple

TABLE 60

Results of the Multiple Linear Regression Analysis of the Peabody Picture Vocabulary Test, Form B (Receptive Vocabulary) and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YPEABIQB
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
PEABIQ	0.54477	0.29677	0.29677	0.54477
SPOKLAN	0.58743	0.34508	0.04831	0.38346
D1	0.63084	0.39796	0.05288	0.24914
D2	0.65517	0.42925	0.03129	-0.12202
PICERR	0.67601	0.45699	0.02774	-0.34250
SYLTOT	0.68532	0.46967	0.01268	0.15545
OBSH	0.69842	0.48780	0.01813	0.02655
CIR2TOT	0.70640	0.49900	0.01120	0.29329
FSIQ	0.71894	0.51688	0.01788	0.45372
AGE	0.72629	0.52750	0.01063	0.10377
D5	0.73275	0.53692	0.00941	-0.07434
MATRS	0.73874	0.54574	0.00882	0.19872
CIR7TOT	0.74655	0.55734	0.01160	0.39537
PICTIME	0.75128	0.56442	0.00708	-0.18133
PERSOC	0.75540	0.57063	0.00621	0.12818
CONHYP	0.76084	0.57887	0.00825	-0.12350
AUDCOMP	0.76558	0.58611	0.00724	0.36879
OBSB	0.76823	0.59018	0.00407	0.14111
OBSF	0.77255	0.59684	0.00666	0.07693
OBSG	0.77635	0.60272	0.00588	0.13772
WRAR	0.78068	0.60947	0.00675	0.21292
WRAA	0.78401	0.61467	0.00520	0.28328
CONPROB	0.78611	0.61797	0.00330	0.02486
CIR9TOT	0.78776	0.62056	0.00259	0.31519
WRAS	0.78932	0.62303	0.00247	0.11578
OBSE	0.79043	0.62477	0.00174	0.02547
OBSJ	0.79137	0.62626	0.00149	0.07659
CONPASS	0.79186	0.62705	0.00079	-0.16682
CONANX	0.79246	0.62799	0.00094	-0.03191
SESFAM	0.79301	0.62886	0.00088	0.12023
OBSI	0.79360	0.62981	0.00094	0.06586
TPBTOTAL	0.79408	0.63057	0.00076	0.07428
OBSA	0.79462	0.63142	0.00086	-0.04353
D3	0.79515	0.63226	0.00083	0.05392
ORIEN	0.79562	0.63301	0.00075	0.09779
MOTCOR	0.79605	0.63370	0.00069	0.09800
OBSD	0.79665	0.63466	0.00096	0.20403
CIR5TOT	0.79715	0.63545	0.00079	0.19443
D4	0.79733	0.63573	0.00028	0.13294
(CONSTANT)				

correlation of .79 accounting for 64% of the variance, F(39,77)=3.446, $p < .01$. The measure of receptive vocabulary skills at the four-year-old kindergarten level was the best single predictor accounting for 30% of the variance in the same measure two years later. Fifty-three per cent of the variance could be accounted for on the basis of ten predictors including English receptive vocabulary skills, ratings of spoken language and effort, sex, handedness, picture-naming in English, word-segmenting skills, IQ and knowledge of quantitative concepts.

Simple correlations with five-year-old kindergarten measures (see Table 59) indicated that receptive vocabulary skills in English were most highly correlated with receptive vocabulary skills in English assessed at the five-year-old kindergarten level, academic achievement in reading and arithmetic, listening comprehension and problem-solving abilities, sex and ratings of performance rate, anxiety and inattentive-passive behavior.

The results of the stepwise multiple regression analysis of five-year-old kindergarten predictors and receptive vocabulary skills in English are presented in

Table 61. Thirty-three of the 34 predictors yielded a multiple correlation of .81 accounting for 66% of the variance, F(33,82)=4.886, $p < .01$. The best single predictor was the measure of English receptive vocabulary skills assessed in five-year-old kindergarten accounting for 47% of the variance. Sex, handedness, the Tactual Performance Test, expressive language skills in English, and ratings of inattentive-passive behavior, interest, effort and performance rate were among the best predictors of English receptive vocabulary skills.

The four- and five-year-old kindergarten batteries had high predictive validity in relation to English receptive vocabulary skills assessed at the end of French immersion grade one. English receptive vocabulary skills measured by the Peabody Picture Vocabulary Test in four- and five-year-old kindergarten were the best single predictors of scores on this measure in grade one. The Peabody scores in five-year-old kindergarten accounted for considerably more variance in later scores than did the four-year-old kindergarten measure, possibly because it was closer in time to the

TABLE 61

Results of the Multiple Linear Regression Analysis of the Peabody Picture Vocabulary Test, Form B (Receptive Vocabulary) and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YPEABIQB
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XPEABIQ	0.68867	0.47427	0.47427	0.68867
D1	0.71896	0.51691	0.04264	0.26358
XCONIP	0.73459	0.53962	0.02271	-0.29966
XRENGRM	0.74527	0.55543	0.01581	0.21870
XOBSJ	0.75282	0.56673	0.01131	-0.03819
XOBSF	0.76050	0.57836	0.01163	0.26235
XTOTTPB	0.76741	0.58892	0.01056	-0.07486
XOBSB	0.77413	0.59928	0.01035	0.39445
D2	0.77810	0.60543	0.00616	-0.05448
XOBSI	0.78255	0.61238	0.00694	0.04336
XOBSE	0.78621	0.61812	0.00574	-0.00162
XOBSA	0.79020	0.62442	0.00630	0.13503
XFWRAA	0.79392	0.63031	0.00589	0.12907
XCONHY	0.79624	0.63400	0.00369	-0.00233
XCONTA	0.79837	0.63739	0.00339	-0.11657
XWRAAG	0.80076	0.64122	0.00383	0.32012
XLOC	0.80256	0.64410	0.00288	0.08267
XWRASG	0.80434	0.64696	0.00286	0.20443
XCIR9T	0.80547	0.64879	0.00182	0.34269
XOBSD	0.80656	0.65055	0.00176	0.21825
XFWRAR	0.80748	0.65202	0.00148	0.04229
XPICTIM	0.80853	0.65371	0.00169	0.11362
XOBSH	0.80995	0.65602	0.00231	0.07536
XMEM	0.81103	0.65777	0.00175	0.10991
XFRCOMPR	0.81171	0.65888	0.00111	0.16609
XWRARG	0.81234	0.65990	0.00102	0.24626
XOBSC	0.81284	0.66072	0.00082	0.22386
XCONCP	0.81338	0.66159	0.00088	0.03101
XSEGSYL	0.81375	0.66219	0.00059	0.08766
XRENINF	0.81397	0.66254	0.00036	0.19420
XAGE	0.81404	0.66267	0.00012	0.04742
D3	0.81410	0.66276	0.00009	0.05575
XCIR13T	0.81417	0.66287	0.00011	0.31282
(CONSTANT)				

criterion assessment. Sex, handedness, and the observer's rating of effort were among the ten best predictors from both predictive batteries. The five-year-old kindergarten Tactual Performance Test was an important predictor of English vocabulary development. However, the shorter, easier four-year-old kindergarten Tactual Performance Test accounted for little of the variance in scores on the Peabody measure of receptive vocabulary in English.

Peabody Picture Vocabulary Test, Form A, Reading Vocabulary: Simple correlations with four-year-old kindergarten measures (see Table 58) indicated that this measure of reading vocabulary skills in English was not correlated highly with any of the tests administered in four-year-old kindergarten.

The results of the stepwise multiple regression analysis of four-year-old kindergarten predictors and reading vocabulary skills in English are presented in Table 62. When thirty-nine of the 43 predictors were combined to yield a multiple correlation of .50 accounting for 25% of the variance, the multiple correlation was not significant, $F(39,77)=0.658$, $p > .05$. The multiple correlation

TABLE 62

Results of the Multiple Linear Regression Analysis of the Peabody Picture Vocabulary Test, Form A (Reading Vocabulary) and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YPEABIQA
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
WRAA	0.22282	0.04965	0.04965	0.22282
CONANX	0.25907	0.06712	0.01746	0.12970
CIR7TOT	0.28630	0.08197	0.01485	0.20982
D4	0.32025	0.10256	0.02059	-0.04186
PICTIME	0.34474	0.11885	0.01629	0.01153
OBSF	0.35958	0.12930	0.01045	0.11963
OBSI	0.38622	0.14917	0.01987	0.00584
PERSOC	0.39534	0.15630	0.00713	-0.00593
CIR13TOT	0.40554	0.16446	0.00817	0.19316
ORIEN	0.41635	0.17335	0.00888	0.07713
MOTCOR	0.42370	0.17952	0.00618	0.11356
CONHYP	0.43328	0.18773	0.00821	-0.06502
TPBTOTAL	0.43756	0.19146	0.00372	-0.05168
CONPASS	0.44238	0.19570	0.00425	-0.00246
CIR5TOT	0.44641	0.19928	0.00358	0.21253
PICERR	0.45109	0.20349	0.00420	-0.04446
OBSD	0.45493	0.20696	0.00347	0.09219
OBSE	0.45893	0.21061	0.00365	0.11745
OBSC	0.46329	0.21464	0.00402	-0.00455
OBSG	0.46650	0.21762	0.00299	0.05531
OBSA	0.47052	0.22139	0.00377	0.00690
SESFAM	0.47343	0.22414	0.00275	0.02721
OBSJ	0.47724	0.22775	0.00361	0.06367
PEABIQ	0.47897	0.22941	0.00166	0.09990
WRAS	0.48045	0.23083	0.00142	0.10650
CIR9TOT	0.48214	0.23246	0.00162	0.16729
SYLTOT	0.48392	0.23418	0.00173	0.07631
OBSH	0.48607	0.23626	0.00208	0.07812
D1	0.48824	0.23838	0.00211	-0.03036
D3	0.49022	0.24032	0.00194	-0.03634
D5	0.49166	0.24173	0.00142	-0.08481
FSIQ	0.49292	0.24297	0.00124	0.22088
AGE	0.49437	0.24441	0.00144	0.04513
CIR2TOT	0.49557	0.24559	0.00119	0.20271
AUDCOMP	0.49669	0.24670	0.00111	0.13498
SPOKLAN	0.49883	0.24883	0.00213	0.14117
WRAR	0.49941	0.24941	0.00058	0.15717
OBSB	0.49971	0.24971	0.00030	0.06902
MATRS	0.49997	0.24997	0.00026	0.12591
(CONSTANT)				

was significant when the first thirteen predictors listed in Table 68 combined to yield a multiple correlation of .44 accounting for 19% of the variance, F(13,103)=1.88, $p < .05$. Arithmetic readiness skills (WRAA) was the best single predictor accounting for 5% of the variance.

Simple correlations with five-year-old kindergarten measures (see Table 59) indicated that performance on the test of reading vocabulary skills in English was not highly correlated with any measures administered in five-year-old kindergarten.

The stepwise multiple regression analysis presented in Table 63 indicated that a combination of 30 of the 34 five-year-old kindergarten predictors yielded a nonsignificant multiple correlation of .55 accounting for 30% of the variance in English reading vocabulary IQ scores, F(30,85)=1.196, $p > .05$. A combination of the first 22 predictors listed in Table 69 yielded a significant multiple correlation of .54 accounting for 12% of the variance, F(22,93)=1.70, $p < .05$. Academic achievement in arithmetic in five-year-old kindergarten was the best single predictor

TABLE 63

Results of the Multiple Linear Regression Analysis of the Peabody Picture Vocabulary Test, Form A (Reading Vocabulary) and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YPEABIQA
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XWRAAG	0.23803	0.05666	0.05666	0.23803
XOBSI	0.33320	0.11102	0.05436	-0.19215
XOBSJ	0.36587	0.13386	0.02284	0.01502
XPEABIQ	0.38954	0.15174	0.01788	-0.03350
XCONIP	0.41144	0.16928	0.01754	-0.18391
XOBSF	0.42897	0.18402	0.01474	-0.09667
XSEGSYL	0.44240	0.19572	0.01170	-0.06699
XWRARG	0.45504	0.20706	0.01135	0.18120
XPICTIM	0.46477	0.21601	0.00895	0.05931
XFRCOMPR	0.47222	0.22300	0.00698	0.15860
XOBSH	0.48344	0.23371	0.01071	-0.12368
XAGE	0.49235	0.24240	0.00869	-0.06388
XOBSC	0.50045	0.25045	0.00804	0.07447
XOBSE	0.50583	0.25587	0.00542	0.03937
XOBSG	0.51110	0.26123	0.00536	-0.11044
XFWRAR	0.5152	0.26549	0.00426	0.18545
XTOTTPB	0.52019	0.27060	0.00511	0.07273
XOBSA	0.52356	0.27411	0.00351	-0.05427
XWRASG	0.52709	0.27782	0.00371	0.21003
D2	0.53045	0.28138	0.00356	0.07352
XCIR9T	0.53448	0.28567	0.00429	0.08645
XCONCP	0.53587	0.28716	0.00148	-0.01074
XRENINF	0.53740	0.28880	0.00164	0.04598
XRENGRM	0.53959	0.29116	0.00236	0.03717
XMEM	0.54106	0.29274	0.00158	0.05602
XLOC	0.54376	0.29568	0.00293	-0.04735
D1	0.54420	0.29616	0.00048	-0.03881
XOBSD	0.54450	0.29648	0.00032	-0.02034
XCONHY	0.54477	0.29677	0.00029	-0.05696
XFWRAA	0.54486	0.29687	0.00010	0.13236
(CONSTANT)				

accounting for 6% of the variance.

The four-year-old and five-year-old kindergarten batteries were poor predictors of English reading vocabulary as measured by the novel presentation of Form A of the Peabody Picture Vocabulary Test. At both kindergarten levels, WRAT arithmetic grade scores, picture-naming in English and ratings of anxiety and cooperation were among the ten best predictors. However, the variance accounted for by these predictors was neglible. The weak association between the predictors and this criterion variable of English achievement may be a function of the nature of the criterion variable. The IQ scores assigned to raw scores on this form were based upon norms developed on the basis of the receptive vocabulary presentation of test items whereby the examiner reads the items to the child. In the present study, the child was required to read the Form A items. The receptive vocabulary norms may not be a consistent measure of the child's actual reading vocabulary.

Academic achievement in English reading (YWRARG): Simple correlations between reading grade score on the Wide Range Achievement Test (WRAT) in grade one and five-year-old kindergarten measures (see Table 58) indicated that reading grade scores were highly correlated with academic achievement in reading, spelling and arithmetic in kindergarten, with IQ (FSIQ, MATRS) all CIRCUS readiness measures, picture-naming, and teachers' ratings of spoken language, auditory comprehension, motor coordination, and personal-social behavior.

The results of the stepwise multiple regression analysis of four-year-old kindergarten predictors and English reading skills are presented in Table 64. Thirty-seven of the 43 variables combined to yield a multiple correlation of .74 accounting for 55% of the variance $F(37,79)=2.640$, $p < .01$. Performance on the WRAT reading subtest at the four-year-old kindergarten level was the best single predictor of subsequent achievement in reading as measured by this test at the end of grade one and accounted for 34% of the variance in reading grade scores. Fifty per cent of the variance could be accounted for on the basis of ten predictors including reading and spelling grade scores, sex, auditory discrimination ability, picture-naming and teachers' ratings of anxiety, amount

TABLE 64

Results of the Multiple Linear Regression Analysis of Academic Achievement in English Reading and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YWRARG
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
WRAR	0.57898	0.33522	0.33522	0.57898
WRAS	0.64095	0.41082	0.07561	0.48902
D1	0.65950	0.43495	0.02412	-0.01852
CIR7TOT	0.67469	0.45520	0.02026	0.46173
CONANX	0.68443	0.46844	0.01324	0.08813
OBSA	0.69404	0.48170	0.01325	-0.16894
MOTCOR	0.70093	0.49131	0.00961	0.29281
PICTIME	0.70534	0.49750	0.00619	-0.14875
AUDCOMP	0.71022	0.50441	0.00691	0.31693
ORIEN	0.71361	0.50924	0.00482	0.17444
OBSB	0.71636	0.51317	0.00394	0.20455
WRAA	0.71880	0.51667	0.00350	0.38176
RENGRAM	0.72129	0.52026	0.00359	0.10266
CONPASS	0.72362	0.52362	0.00336	-0.15112
SESFAM	0.72561	0.52651	0.00289	0.17061
PEABIQ	0.72803	0.53003	0.00352	0.14828
RENINF	0.73026	0.53328	0.00325	0.07939
CIR13TOT	0.73226	0.53620	0.00292	0.32055
D3	0.73363	0.53821	0.00201	0.06291
SPOKLAN	0.73525	0.54059	0.00237	0.37268
D4	0.73630	0.54214	0.00156	0.19820
D5	0.73756	0.54400	0.00185	-0.20118
CIR5TOT	0.73852	0.54541	0.00141	0.34612
TPBTOTAL	0.73900	0.54612	0.00072	-0.06596
D2	0.73999	0.54759	0.00146	0.06186
PERSOC	0.74052	0.54837	0.00078	0.26617
OBSI	0.74107	0.54918	0.00081	0.21169
OBSD	0.74158	0.54994	0.00076	0.13863
CIR2TOT	0.74203	0.55061	0.00067	0.42203
MATRS	0.74250	0.55131	0.00070	0.29767
CONPROB	0.74287	0.55185	0.00054	-0.09533
SYLTOT	0.74300	0.55205	0.00020	0.18580
PICERR	0.74313	0.55224	0.00019	-0.25763
OBSC	0.74326	0.55244	0.00020	0.22357
OBSE	0.74335	0.55257	0.00012	0.15392
OBSH	0.74349	0.55278	0.00021	0.21504
OBSG	0.74356	0.55288	0.00010	0.11155
(CONSTANT)				

of motor activity, motor coordination, auditory comprehension and orientation.

Simple correlations with five-year-old kindergarten predictors (see Table 59) indicated that English reading scores in grade one were most highly correlated with academic achievement in reading, spelling and arithmetic in five-year-old kindergarten, with knowledge of numbers in French, receptive vocabulary skills in English, listening comprehension, and ratings of performance rate and inattentive-passive behavior.

The stepwise multiple regression analysis of five-year-old kindergarten predictors and WRAT reading grade scores are presented in Table 65. The 34 predictors yielded a multiple correlation of .90 accounting for 81% of the variance, $F(34,81)=9.89$, $p<.01$. WRAT reading grade scores in five-year-old kindergarten were the best single predictor of scores on this test at the end of grade one and accounted for 62% of the variance.

The four- and five-year-old kindergarten batteries were highly predictive of achievement in English reading in French immersion grade one. The

TABLE 65

Results of the Multiple Linear Regression Analysis of Academic Achievement in English Reading and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YWRARG
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XWRARG	0.78660	0.61874	0.61874	0.78660
XWRASG	0.83287	0.69368	0.07494	0.68997
XWRAAG	0.84228	0.70943	0.01575	0.52816
XLOC	0.85048	0.72332	0.01389	-0.00577
XPICTIM	0.86162	0.74240	0.01908	0.11295
XCIR13T	0.86662	0.75102	0.00863	0.14701
XCIR9T	0.87123	0.75903	0.00801	0.25797
XMEM	0.87556	0.76660	0.00757	0.04651
XCONHY	0.87736	0.76976	0.00316	-0.10557
XOBSH	0.87959	0.77369	0.00392	0.12111
XOBSD	0.88135	0.77678	0.00310	0.19347
XTOTTPB	0.88255	0.77890	0.00211	-0.13148
XAGE	0.88399	0.78144	0.00255	-0.13870
XFRCOMPR	0.88512	0.78344	0.00199	0.12625
XSEGSYL	0.88653	0.78593	0.00250	0.20195
XRENGRM	0.88788	0.78833	0.00240	0.11351
XRENINF	0.89028	0.79259	0.00426	0.09774
XOBSF	0.89106	0.79399	0.00140	0.23162
XFWRAA	0.89182	0.79534	0.00135	0.36042
XFWRAR	0.89245	0.79647	0.00113	0.22008
XCONIP	0.89306	0.79756	0.00110	-0.35672
XOBSA	0.89369	0.79868	0.00111	0.15217
XCONTA	0.89432	0.79981	0.00114	-0.08960
D3	0.89490	0.80085	0.00104	0.06995
XCONCP	0.89527	0.80151	0.00066	-0.06132
XOBSB	0.89562	0.80213	0.00062	0.41198
XOBSI	0.89602	0.80285	0.00072	0.11388
XOBSJ	0.89641	0.80355	0.00070	0.15419
XOBSC	0.89669	0.80406	0.00051	0.22839
XOBSE	0.89704	0.80468	0.00062	0.13206
D1	0.89726	0.80507	0.00039	-0.03232
XPEABIQ	0.89748	0.80547	0.00040	0.25129
D2	0.89765	0.80577	0.00030	0.11065
XOBSG	0.89771	0.80589	0.00012	0.21972
(CONSTANT)				

five-year-old kindergarten measures were better predictors than the four-year-old kindergarten measures. Achievement in English reading and spelling (WRAT) and the speed of picture-naming in English were among the ten best predictors at both kindergarten levels. Again, the five-year-old kindergarten Tactual Performance Test was a better predictor of English achievement than the four-year-old kindergarten version of this test.

Academic achievement in English spelling (YWRASR): Simple correlations with four-year-old kindergarten measures (see Table 58) indicated that WRAT spelling grade scores at the end of grade one French immersion were most highly correlated with WRAT reading, spelling and arithmetic grade scores in four-year-old kindergarten, with FSIQ, all CIRCUS readiness measures and teachers' ratings of auditory comprehension and spoken language.

Stepwise multiple regression analysis of the four-year-old kindergarten predictors and WRAT spelling grade scores, presented in Table 66, yielded a multiple correlation of .78 based on a combination of 41 variables and accounting for 60% of the variance, $F(41,75)=2.774$, $p < .01$.

TABLE 66

Results of the Multiple Linear Regression Analysis of Academic Achievement in English Spelling and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YWRASR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
WRAR	0.63506	0.40330	0.40330	0.63506
WRAS	0.67296	0.45287	0.04957	0.46443
OBSA	0.68408	0.46797	0.01510	-0.17946
D1	0.69298	0.48022	0.01226	-0.07417
OBSE	0.69900	0.48859	0.00837	0.08785
OBSB	0.70744	0.50047	0.01188	0.19533
SESFAM	0.71454	0.51057	0.01010	0.17057
CONHYP	0.72134	0.52033	0.00976	-0.17331
AUDCOMP	0.72688	0.52836	0.00803	0.26422
SYLTOT	0.73155	0.53516	0.00681	0.17884
WRAA	0.73644	0.54234	0.00718	0.32823
D3	0.73972	0.54719	0.00485	0.07771
FSIQ	0.74264	0.55151	0.00432	0.41324
PICERR	0.74635	0.55703	0.00552	-0.21015
CIR7TOT	0.74971	0.56206	0.00503	0.41380
D5	0.75228	0.56592	0.00386	-0.18231
CONANX	0.75384	0.56827	0.00235	0.06426
D4	0.75554	0.57084	0.00256	0.18844
OBSD	0.75687	0.57285	0.00202	0.16318
MOTCOR	0.75852	0.57535	0.00250	0.22633
CIR13TOT	0.75983	0.57735	0.00200	0.32688
CIR2TOT	0.76164	0.58009	0.00275	0.37862
TPBTOTAL	0.76325	0.58255	0.00246	-0.08836
PICTIME	0.76460	0.58462	0.00207	-0.14040
CONPROB	0.76552	0.58602	0.00140	-0.11173
OBSI	0.76658	0.58765	0.00163	0.24315
OBSH	0.76791	0.58969	0.00204	0.15256
PERSOC	0.76905	0.59144	0.00175	0.24285
RENINF	0.77000	0.59290	0.00146	0.05362
RENGRAM	0.77202	0.59601	0.00311	0.09285
OBSC	0.77318	0.59781	0.00180	0.18549
SPOKLAN	0.77369	0.59859	0.00079	0.33762
MATRS	0.77410	0.59924	0.00064	0.18247
PEABIQ	0.77442	0.59972	0.00048	0.17672
CIR9TOT	0.77478	0.60028	0.00056	0.24905
OBSF	0.77511	0.60080	0.00052	0.23742
OBSG	0.77549	0.60138	0.00058	0.13358
CONPASS	0.77593	0.60207	0.00069	-0.09738
ORIEN	0.77612	0.60236	0.00029	0.08049
D2	0.77620	0.60248	0.00012	0.09201
AGE	0.77626	0.60258	0.00010	0.04746
(CONSTANT)				

WRAT reading grade score in four-year-old kindergarten was the best single predictor accounting for 40% of the variance. Fifty-four per cent of the variance could be accounted for on the basis of ten predictors including WRAT reading and spelling grade scores, word segmenting, sex, SES, and ratings of amount of motor activity, attention, performance rate, hyperactivity and auditory comprehension.

Simple correlations between five-year-old kindergarten measures and WRAT spelling grade scores (see Table 59) indicated high correlations with reading, spelling and arithmetic grade scores in five-year-old kindergarten, with English receptive vocabulary skills, with knowledge of numbers in French and with ratings of performance rate, manual dexterity, anxiety and inattentive-passive behavior.

The results of the stepwise multiple regression analysis of five-year-old kindergarten predictors and spelling grade scores are presented in Table 67. Thirty-two of the 34 predictors combined to yield a multiple correlation of .85 accounting for 72% of the variance, F(32,83)=

TABLE 67

Results of the Multiple Linear Regression Analysis of Academic Achievement in English Spelling and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YWRASK
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XWRARG	0.74121	0.54940	0.54940	0.74121
XWRASG	0.77101	0.59445	0.04505	0.61355
XOBSF	0.78837	0.62152	0.02707	0.33925
XMEM	0.79949	0.63919	0.01767	0.02770
XPICTIM	0.81443	0.66330	0.02411	0.15217
XCONTA	0.81813	0.66934	0.00603	-0.02965
XOBSG	0.82220	0.67601	0.00668	0.21606
XLOC	0.82466	0.68006	0.00404	0.03711
XCONIP	0.82681	0.68361	0.00356	-0.31283
XCIR13T	0.82941	0.68792	0.00431	0.18122
XOBSE	0.83112	0.69076	0.00284	0.09357
XOBSB	0.83274	0.69345	0.00269	0.43284
D3	0.83377	0.69517	0.00172	0.08435
D1	0.83510	0.69739	0.00221	-0.08459
XRENINF	0.83606	0.69900	0.00161	0.11073
XCONHY	0.83695	0.70048	0.00148	-0.13826
XTOTTPB	0.83782	0.70194	0.00146	-0.14910
XFRCOMPR	0.83847	0.70304	0.00110	0.11788
XOBSA	0.83912	0.70412	0.00108	0.20598
XCIR9T	0.83965	0.70502	0.00090	0.15683
XRENGRM	0.84030	0.70611	0.00109	0.14151
XOBSJ	0.84091	0.70713	0.00102	0.21993
XOBSI	0.84209	0.70912	0.00200	0.19414
XOBSH	0.84312	0.71085	0.00173	0.20229
XFWRAR	0.84423	0.71272	0.00187	0.19751
XAGE	0.84489	0.71384	0.00113	-0.04278
XFWRAA	0.84559	0.71503	0.00119	0.32098
XOBSC	0.84602	0.71574	0.00071	0.29717
D2	0.84622	0.71609	0.00035	0.14714
XWRAAG	0.84627	0.71618	0.00008	0.42179
XPEABIQ	0.84634	0.71629	0.00012	0.26028
XOBSD	0.84640	0.71639	0.00010	0.21237
(CONSTANT)				

6.552, $p < .01$. Reading grade scores at the five-year-old kindergarten level were the best single predictor of spelling grade scores in grade one and accounted for 55% of the variance.

Thus, the four- and five-year-old kindergarten batteries were also highly predictive of achievement in English spelling in French immersion grade one. Similar to the findings regarding English reading, the five-year-old kindergarten measures accounted for more of the variance in grade one achievement than did the four-year-old kindergarten measures. Achievement in English reading and spelling (WRAT) in four- and five-year-old kindergarten were the best predictors of later achievement in English spelling. The five-year-old kindergarten Tactual Performance Test was more important than the four-year-old kindergarten version of this test in predicting achievement in English spelling.

Academic achievement in arithmetic (YWRAAR): Simple correlations with four-year-old kindergarten measures indicated that WRAT arithmetic grade scores at the end of French immersion grade one (see Table 58) were highly correlated with WRAT spelling and arithmetic scores in four-year-old kindergarten, FSIQ, teachers' ratings of spoken language, auditory comprehension, motor coordination, personal-social behavior and inattentive-passive behavior, readiness measures of quantitative concepts, listening comprehension and problem-solving and ratings of amount of motor activity, performance rate, attention and self-confidence.

The results of the stepwise multiple regression analysis of four-year-old kindergarten predictors and arithmetic grade scores at the end of French immersion grade one are presented in Table 68. Thirty-eight of the 43 predictors combined to yield a multiple correlation of .74 accounting for 55% of the variance, $F(38,78)=2.495$, $p < .01$. WRAT spelling scores in four-year-old kindergarten were the best single predictor accounting for 17% of the variance.

Five-year-old kindergarten measures of spelling and arithmetic skills in English, knowledge of alphabetic characters in French and inattentive-passive behavior correlated most highly with arithmetic grade scores at the end of grade one (see Table 59).

TABLE 68

Results of the Multiple Linear Regression Analysis of Academic Achievement in Arithmetic and Four-Year-Old Kindergarten Predictors

Dependent Variable..   YWRAAR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
WRAS	0.41388	0.17129	0.17129	0.41388
OBSA	0.50051	0.25051	0.07921	-0.32566
MOTCOR	0.55642	0.30960	0.05909	0.41147
D1	0.57820	0.33431	0.02471	-0.00800
CONHYP	0.59611	0.35535	0.02104	-0.22085
D4	0.61215	0.37473	0.01938	0.04370
OBSG	0.62986	0.39673	0.02200	0.24779
OBSH	0.65990	0.43547	0.03874	0.13306
CIR2TOT	0.66982	0.44866	0.01319	0.34278
PEABIQ	0.68694	0.47188	0.02322	0.00272
OBSB	0.69429	0.48203	0.01015	0.24603
FSIQ	0.69824	0.48753	0.00550	0.33404
AUDCOMP	0.70194	0.49273	0.00519	0.30480
SPOKLAN	0.70537	0.49754	0.00482	0.39841
CIR13TOT	0.70889	0.50253	0.00499	0.26042
AGE	0.71253	0.50769	0.00516	0.11439
WRAA	0.71783	0.51528	0.00759	0.37122
OBSF	0.72050	0.51912	0.00384	0.21543
CONPROB	0.72250	0.52201	0.00289	-0.11157
CIR5TOT	0.72534	0.52612	0.00411	0.17983
CONANX	0.72790	0.52985	0.00373	-0.07191
RENINF	0.72978	0.53257	0.00273	0.04407
D2	0.73119	0.53464	0.00207	-0.06232
SYLTOT	0.73258	0.53667	0.00202	0.06247
PICERR	0.73386	0.53855	0.00188	-0.12185
D5	0.73534	0.54073	0.00218	-0.16686
SESFAM	0.73661	0.54260	0.00187	0.02847
TPBTOTAL	0.73791	0.54451	0.00191	-0.05570
MATRS	0.73836	0.54517	0.00066	0.22405
PICTIME	0.73870	0.54567	0.00050	-0.16812
OBSI	0.73921	0.54644	0.00076	0.18616
OBSD	0.73949	0.54685	0.00041	0.00824
PERSOC	0.73978	0.54727	0.00042	0.32327
OBSJ	0.74006	0.54769	0.00042	0.24100
RENGRAM	0.74037	0.54815	0.00046	0.07073
CIR9TOT	0.74050	0.54835	0.00020	0.24959
CIR7TOT	0.74061	0.54850	0.00015	0.21355
CONPASS	0.74069	0.54862	0.00012	-0.25300
(CONSTANT)				

The stepwise multiple regression analysis of five-year-old kindergarten measures and grade one arithmetic grade scores yielded a multiple correlation of .71 based on a combination of 30 variables and accounting for 51% of the variance. These results are presented in Table 69. Arithmetic grade scores at the end of five-year-old kindergarten accounted for 23% of the variance in arithmetic scores at the end of grade one.

Although the five-year-old kindergarten measures were found to be better predictors of English reading and spelling than the four-year-old kindergarten predictors, this trend was not observed in terms of the prediction of achievement in arithmetic measured in English. Both the four- and five-year-old kindergarten predictors accounted for approximately 50% of the variance in WRAT arithmetic grade scores in grade one. Achievement on the WRAT arithmetic subtest in five-year-old kindergarten was the best predictor of achievement on this measure in grade one. However, performance on this test in four-year-old kindergarten was not among the best four-year-old kindergarten predictors of later achievement and WRAT spelling

TABLE 69

Results of the Multiple Linear Regression Analysis of Academic Achievement in Arithmetic and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YWRAAR
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XWRAAG	0.47769	0.22819	0.22819	0.47769
XCONIP	0.52915	0.28000	0.05181	-0.38654
XMEM	0.55722	0.31049	0.03049	-0.09405
XOBSA	0.57427	0.32979	0.01929	-0.07966
XAGE	0.59013	0.34825	0.01846	-0.12358
XFWRAA	0.60360	0.36434	0.01609	0.02222
XFWRAR	0.61888	0.38301	0.01867	0.28089
D1	0.62774	0.39405	0.01105	-0.01746
XWRASG	0.63591	0.40439	0.01033	0.29920
XWRARG	0.64701	0.41862	0.01424	0.12168
XOBSE	0.65829	0.43335	0.01472	0.02054
XOBSI	0.66506	0.44231	0.00896	0.05446
XFRCOMPR	0.67202	0.45161	0.00930	0.19613
XCIR13T	0.67907	0.46114	0.00954	0.21325
D2	0.68782	0.47310	0.01195	0.02045
XOBSD	0.69287	0.48007	0.00697	0.01343
XOBSC	0.69699	0.48580	0.00573	0.13020
XCONTA	0.70041	0.49058	0.00478	-0.01875
XCIR9T	0.70350	0.49491	0.00433	0.20474
XRENINF	0.70502	0.49706	0.00215	0.02765
XCONCP	0.70598	0.49841	0.00136	-0.08765
XPICTIM	0.70700	0.49985	0.00143	0.05677
XOBSG	0.70798	0.50124	0.00139	0.15616
XLOC	0.70863	0.50216	0.00092	-0.04117
XSEGSYL	0.70911	0.50283	0.00067	0.09278
XRENGRM	0.70964	0.50359	0.00075	0.06612
XOBSJ	0.71032	0.50456	0.00097	0.05329
XTOTTPB	0.71085	0.50531	0.00075	-0.04774
XOBSF	0.71109	0.50566	0.00035	0.11070
D3	0.71117	0.50577	0.00011	0.05075
(CONSTANT)				

grade scores in four-year-old kindergarten best predicted later achievement in arithmetic. The amount of motor activity and sex were the only variables which were among the best predictors at both kindergarten levels.

Renfrew Action Picture Test (Information): Simple correlations with four-year-old kindergarten measures (see Table 64) indicated that this measure of expressive language skills in English was most highly correlated with auditory discrimination ability, word-segmenting, expressive language test scores in four-year-old kindergarten, spelling scores, and amount of speech.

The results of the stepwise multiple regression analysis of four-year-old kindergarten predictors and Renfrew information scores are presented in Table 70. Forty of the 43 variables yielded a multiple correlation of .73 accounting for 53% of the variance, $F(40,76) = 2.123$, $p < .01$. The best single predictor, auditory discrimination ability (CIR7TOT), accounted for 11% of the variance.

Renfrew information scores were most highly correlated with five-year-old kindergarten ratings of

TABLE 70

Results of the Multiple Linear Regression Analysis of the Renfrew Action Picture Test (Information) and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YRENINF
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
CIR7TOT	0.33503	0.11225	0.11225	0.33503
PEABIQ	0.41414	0.17151	0.05927	-0.05392
OBSD	0.45774	0.20953	0.03801	0.27527
TPBTOTAL	0.48841	0.23854	0.02901	-0.18353
D2	0.51996	0.27036	0.03182	-0.05834
OBSB	0.54087	0.29254	0.02218	0.07702
SYLTOT	0.55754	0.31085	0.01832	0.31220
D5	0.57649	0.33234	0.02149	0.02184
D4	0.60330	0.36397	0.03163	0.14747
RENINF	0.62883	0.39542	0.03145	0.26061
MOTCOR	0.64428	0.41510	0.01968	0.18360
AUDCOMP	0.65531	0.42942	0.01433	0.15687
SESFAM	0.66465	0.44176	0.01233	0.13820
CONPASS	0.67161	0.45106	0.00930	-0.18861
WRAR	0.68000	0.46240	0.01134	0.20547
CONANX	0.68716	0.47220	0.00980	-0.00231
CIR9TOT	0.69303	0.48029	0.00809	0.03913
CIR13TOT	0.69972	0.48960	0.00932	0.21298
WRAS	0.70285	0.49400	0.00440	0.24562
CIR2TOT	0.70668	0.49939	0.00539	0.22935
PICERR	0.70974	0.50373	0.00434	-0.19034
ORIEN	0.71262	0.50782	0.00410	0.15500
MATRS	0.71477	0.51090	0.00307	0.12944
OBSH	0.71615	0.51287	0.00197	0.06966
OBSC	0.71766	0.51504	0.00217	0.13085
CIR5TOT	0.71902	0.51699	0.00196	0.23086
OBSJ	0.72021	0.51870	0.00170	0.15594
WRAA	0.72109	0.51997	0.00127	0.19254
PERSOC	0.72200	0.52128	0.00131	0.14709
D1	0.72324	0.52307	0.00180	-0.16823
OBSA	0.72360	0.52360	0.00053	-0.06931
CONHYP	0.72392	0.52406	0.00046	-0.05464
CONPROB	0.72476	0.52527	0.00121	-0.01748
PICTIME	0.72524	0.52598	0.00071	-0.12697
OBSF	0.72552	0.52638	0.00041	0.17475
AGE	0.72592	0.52696	0.00058	0.00916
FSIQ	0.72621	0.52738	0.00042	0.22114
OBSE	0.72633	0.52755	0.00017	0.05903
D3	0.72639	0.52765	0.00010	-0.03089
SPOKLAN	0.72646	0.52775	0.00010	0.16147
(CONSTANT)				

self-confidence and interest (see Table 59).

The stepwise multiple regression analysis of five-year-old kindergarten predictors and expressive language scores in English yielded a nonsignificant multiple correlation of .50 accounting for 25% of the variance and based on a combination of 30 predictors, $F(30,85)=0.968$, $p > .05$. These results are presented in Table 71. The first 17 predictors listed in Table 71 combined to yield a significant multiple correlation of .49 accounting for 24% of the variance, $F(17,98)=1.82$, $p < .05$. The best single predictor, the rating of self-confidence, accounted for only 6% of the variance.

The four-year-old kindergarten measures were predictive of later expressive language skills in English as measured by the Renfrew Action Picture Test (Information). However, the five-year-old kindergarten measures had very little predictive validity in relation to this criterion variable. The best predictors included four-year-old kindergarten measures of auditory discrimination ability, the Tactual Performance Test, and language skills (receptive vocabulary, word segmenting, Renfrew).

TABLE 71

Results of the Multiple Linear Regression Analysis of the Renfrew Action Picture Test (Information) and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YRENINF
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XOBSG	0.25476	0.06490	0.06490	0.25476
D1	0.33157	0.10994	0.04503	-0.23930
XRENINF	0.37174	0.13819	0.02825	0.18086
XSEGSYL	0.39569	0.15657	0.01838	0.22639
XWRARG	0.40876	0.16709	0.01051	0.16942
XWRAAG	0.42312	0.17903	0.01195	0.03788
XWRASG	0.43208	0.18669	0.00766	0.20330
D3	0.44198	0.19535	0.00865	-0.03747
XAGE	0.44890	0.20151	0.00617	0.05283
XFRCOMPR	0.45571	0.20767	0.00616	-0.02830
XTOTTPB	0.46151	0.21299	0.00532	0.02375
XOBSI	0.46892	0.21989	0.00690	0.21956
XCONCP	0.47305	0.22377	0.00389	-0.08905
XOBSC	0.47766	0.22816	0.00439	0.15104
XFWRAR	0.48139	0.23174	0.00358	0.08311
XOBSH	0.48674	0.23691	0.00517	0.12802
XCONTA	0.48931	0.23943	0.00251	-0.10936
XCIR9T	0.49278	0.24284	0.00341	0.01840
XCONIP	0.49458	0.24461	0.00177	-0.12409
XCONHY	0.49732	0.24733	0.00273	-0.13837
XCIR13T	0.49853	0.24853	0.00120	0.10232
XOBSB	0.49943	0.24943	0.00090	0.17845
XOBSJ	0.50011	0.25011	0.00067	0.24600
XOBSD	0.50093	0.25093	0.00082	0.08491
XRENGRM	0.50164	0.25164	0.00072	0.18229
XOBSA	0.50245	0.25245	0.00081	0.11405
XOBSF	0.50299	0.25300	0.00055	0.19298
XLOC	0.50352	0.25353	0.00053	0.08717
XPEABIQ	0.50425	0.25426	0.00073	0.00894
D2	0.50454	0.25456	0.00029	-0.02047
(CONSTANT)				

Renfrew Action Picture Test (Grammar): Simple correlations between four-year-old kindergarten measures and Renfrew grammar scores at the end of French immersion grade one (see Table 58) indicated that grammar scores were most highly correlated with CIRCUS readiness measures, academic achievement in reading, spelling and arithmetic, FSIQ, word-segmenting, grammar scores in four-year-old kindergarten and ratings of spoken language, auditory comprehension, motor coordination, anxiety and cooperation.

The results of the stepwise multiple regression analysis of four-year-old kindergarten measures and Renfrew grammar scores are presented in Table 72. Forty variables combined to yield a multiple correlation of .73 accounting for 54% of the variance, $F(40,76)=2.193$, $p < .01$. Problem-solving ability (CIR13TOT) was the best single predictor and accounted for 19% of the variance.

At the five-year-old kindergarten level, simple correlations with Renfrew grammar scores (see Table 59) were highest for the Renfrew information and grammar scores in four-year-old kindergarten, problem-solving ability, sex, and ratings of anxiety, interest and inattentive-

TABLE 72

Results of the Multiple Linear Regression Analysis of the Renfrew Action Picture Test (Grammar) and Four-Year-Old Kindergarten Predictors

Dependent Variable.. YRENGRM
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
CIR13TOT	0.43862	0.19239	0.19239	0.43862
SYLTOT	0.49916	0.24916	0.05677	0.35430
SPOKLAN	0.54715	0.29938	0.05022	0.37406
D2	0.56587	0.32021	0.02083	-0.11836
TPBTOTAL	0.58338	0.34033	0.02012	-0.10814
D1	0.59619	0.35545	0.01512	-0.17794
PERSOC	0.60759	0.36916	0.01371	0.16135
CIR7TOT	0.61747	0.38127	0.01211	0.41781
D5	0.62806	0.39446	0.01319	-0.10791
D4	0.63871	0.40795	0.01348	0.20290
AGE	0.64655	0.41802	0.01007	0.09965
MOTCOR	0.65315	0.42661	0.00859	0.28930
MATRS	0.65996	0.43555	0.00894	0.19846
WRAA	0.66667	0.44445	0.00890	0.38890
OBSD	0.67200	0.45158	0.00713	0.23336
PEABIQ	0.67734	0.45879	0.00721	0.13996
CIR9TOT	0.68282	0.46624	0.00744	0.30325
ORIEN	0.68820	0.47362	0.00738	-0.00893
CONPROB	0.69321	0.48054	0.00693	0.05015
OBSF	0.69663	0.48529	0.00475	0.24993
OBSG	0.70756	0.50065	0.01535	0.22322
AUDCOMP	0.71160	0.50637	0.00572	0.32315
OBSJ	0.71370	0.50937	0.00300	0.21435
CONPASS	0.71586	0.51246	0.00309	-0.23666
PICERR	0.71705	0.51416	0.00170	-0.23380
OBSE	0.71847	0.51620	0.00205	0.15593
OBSA	0.72087	0.51966	0.00346	-0.17308
OBSI	0.72225	0.52165	0.00199	0.28045
RENGRAM	0.72323	0.52306	0.00141	0.27139
CIR5TOT	0.72428	0.52458	0.00152	0.31638
PICTIME	0.72538	0.52617	0.00159	-0.21373
FSIQ	0.72639	0.52765	0.00148	0.35949
WRAS	0.72787	0.52979	0.00214	0.30692
OBSC	0.72872	0.53103	0.00124	0.23220
D3	0.72973	0.53250	0.00147	-0.02373
CIR2TOT	0.73027	0.53330	0.00080	0.36925
SESFAM	0.73091	0.53423	0.00094	0.08393
OBSH	0.73156	0.53519	0.00095	0.16410
CONANX	0.73195	0.53575	0.00056	-0.06666
WRAR	0.73200	0.53582	0.00007	0.29828
(CONSTANT)				

passive behavior.

The results of the multiple regression analysis of five-year-old kindergarten predictors and Renfrew grammar scores are presented in Table 73. Thirty-one of the 34 predictors combined to yield a nonsignificant multiple correlation of .61 accounting for 37% of the variance, $F(31,84)=1.568$, $p > .05$. The first 30 predictors listed in Table 73 yielded a significant multiple correlation of .61 accounting for 37% of the variance, $F(30,85)=1.64$, $p < .05$. Renfrew information scores in five-year-old kindergarten were the best single predictor of grammar scores at the grade one level accounting for 10% of the variance.

The findings with regard to the grammar scores on the Renfrew Action Picture Test were similar to the results for the information scores. The four-year-old kindergarten measures were more highly predictive of grammar scores than were the five-year-old kindergarten measures. At both kindergarten levels, sex, and the Tactual Performance Test were among the best predictors of English grammar skills. Verbal and nonverbal problem-

TABLE 73

Results of the Multiple Linear Regression Analysis of the Renfrew Action Picture Test (Grammar) and Five-Year-Old Kindergarten Predictors

Dependent Variable.. YRENGRM
Summary Table

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R
XRENINF	0.32050	0.10272	0.10272	0.32050
XCONIP	0.42266	0.17864	0.07592	-0.30721
D1	0.46971	0.22063	0.04198	-0.25158
XOBSF	0.49862	0.24862	0.02800	0.29920
XTOTTPB	0.51516	0.26539	0.01677	0.06559
XCONTA	0.53031	0.28123	0.01583	-0.23222
D3	0.54219	0.29397	0.01274	-0.02785
XOBSI	0.55169	0.30436	0.01040	0.23379
XWRASG	0.55802	0.31138	0.00702	0.22313
XOBSE	0.56341	0.31743	0.00605	0.12406
XOBSD	0.56927	0.32407	0.00664	0.12382
XFWRAR	0.57468	0.33025	0.00618	0.10617
XMEM	0.57958	0.33592	0.00566	0.17034
XLOC	0.58592	0.34330	0.00739	0.06912
XPEABIQ	0.58955	0.34757	0.00427	0.16250
XFRCOMPR	0.59275	0.35135	0.00378	0.05832
XWRAAG	0.59455	0.35348	0.00213	0.18660
XCONHY	0.59659	0.35593	0.00244	-0.08944
XCIR13T	0.59835	0.35802	0.00209	0.24670
XCONCP	0.59983	0.35979	0.00177	0.00070
XAGE	0.60107	0.36129	0.00150	0.02275
XFWRAA	0.60191	0.36229	0.00100	0.05091
D2	0.60260	0.36313	0.00084	-0.03721
XOBSB	0.60316	0.36380	0.00067	0.22320
XCIR9T	0.60377	0.36454	0.00074	0.20278
XPICTIM	0.60403	0.36485	0.00031	0.08518
XOBSG	0.60441	0.36531	0.00047	0.23842
XOBSC	0.60479	0.36578	0.00046	0.19460
XWRARG	0.60507	0.36611	0.00033	0.16815
XOBSA	0.60527	0.36635	0.00024	0.17248
XRENGRM	0.60541	0.36652	0.00017	0.27094
(CONSTANT)				

solving ability (CIRCUS #13, Tactual Performance Test, word-segmenting) and auditory discrimination ability assessed in four-year-old kindergarten were predictive of grammar scores on the Renfrew Action Picture Test.

Discussion of the Prediction of Relative Rates of Progress in French Immersion

Discriminant function analyses comparing High and Low achievers in French immersion on the four-year-old Early Identification Assessment Battery and on the five-year-old Kindergarten Follow-up Assessment Battery yielded significant discriminant functions which separated these groups. On the basis of 11 tests from the Early Identification Assessment Battery, together with the Observers' Checklist, teachers' ratings of behavior (Conners, Myklebust scores), and socioeconomic status, highly accurate predictions could be made regarding relative rates of achievement in French immersion grade one. The tests which discriminated between High and Low achievers included WPPSI FSIQ, Matrices (nonverbal IQ measure), WRAT spelling, word segmenting, the

Renfrew Action Picture Test, CIRCUS measures of quantitative concepts, knowledge of letters and numbers, and auditory discrimination, and colour-naming. Although Low achievers had Bright Normal IQ, well developed English language skills and adequate readiness skills, they lagged behind High achievers in these areas. Low achievers also received poorer behavior ratings. Low achievers tended to be more active, anxious, and slow, to be less interested, cooperative, talkative and coordinated, and to put forth less effort.

At the five-year-old kindergarten level, Low and High achievers could be discriminated on the basis of knowledge of object names in French, problem-solving, WRAT arithmetic, word segmenting, the Tactual Performance Test, the Observers' Checklist and ratings of inattentive-passive and hyperactive behavior (Conners). Again, as in four-year-old kindergarten, Low achievers were more inattentive-passive, more active, slower and less attentive, cooperative and interested. They had poorer problem-solving, word segmenting and psychomotor problem-solving ability. The inclusion of the Tactual Performance Test in the discriminant function further indicates the importance of the Tactual Performance Test in discriminating children who will have difficulty in French immersion from children who will do well. The four-year-old kindergarten Tactual Performance Test was not important in discriminating Low and High achievers. However, as was pointed out earlier, the four-year-old kindergarten version of the test was a much simpler modified version utilizing only three blocks, as opposed to six blocks at the five-year-old kindergarten level. The discrepancy in the level of difficulty of the Tactual Performance Test at the two kindergarten levels may account for the lack of importance of this test at the four-year-old kindergarten level and its importance at the five-year-old kindergarten level for discriminating between High and Low achievers in French immersion.

Data for all of the predictive and criterion measures assessed in the three years of the Assessment of Readiness for Primary French Immersion were available for 116 of the 124 children who continued in French immersion to the end of the grade one year. The validity of the measures obtained in four- and five-year-old kindergarten as predictors of relative rates of success in the primary French immersion program to the end of grade one was assessed in stepwise multiple linear regression analyses in relation to seven criterion measures of achievement in French and in relation to seven criterion measures of achievement in English assessed in grade one.

The multiple regression analyses indicated that the four-year-old kindergarten Early Identification Assessment Battery accounted for considerable variance in some of the criterion measures. On the basis of the predictors included in the multiple regression analyses by the stepwise procedure, from 43 to 64% of the variance in grade one French criterion variables could be explained on the basis of four-year-old kindergarten predictors. From 25 to 64% of the variance in grade one English criterion variables was accounted for by the four-year-old kindergarten predictors. Thus, the four-year-old kindergarten Early Identification Assessment Battery had predictive validity in relation to achievement assessed in both French and English in French immersion grade one.

Measures of the five-year-old Kindergarten Follow-up Assessment Battery were also found to have considerable predictive validity in relation to some criterion measures of achievement assessed in French and in English in grade one. The five-year-old kindergarten predictors accounted for 38 to 57% of the variance in French criterion variables and for 25 to 81% of the variance in English criteria. Thus, the five-year-old kindergarten Follow-up Assessment Battery was more highly predictive of some English criteria than was the Early Identification Assessment Battery. However, the five-year-old kindergarten measures had less predictive validity than the four-year-old kindergarten measures in relation to most French criterion variables.

With regard to criterion variables of achievement in French, the four- and five-year-old kindergarten measures were most highly predictive of scores on the French Comprehension Test, Level One, and the Test de Rendement en Français, Level One. The four-year-old kindergarten predictors accounted for approximately 64% of the variance in scores on both measures and the five-year-old kindergarten predictors accounted for 57% of the variance in these scores. Three four-year-old kindergarten measures were among the ten best predictors of scores on both the French Comprehension Test and the Test de Rendement en Français, manely, age, FSIQ, and the teachers' ratings of inattentive-passive behavior (Conners scale). Four five-year-old kindergarten measures were highly predictive of scores on both of these criterion variables, namely, scores on the Primer version of the French Comprehension Test, receptive vocabulary in English (Peabody) and observers' ratings of amount of motor activity and manual dexterity. The Tactual Performance Test, handedness and the teachers' rating of inattentive-passive behavior were among the ten best predictors of French Comprehension Test scores from both kindergarten batteries. This finding is consistent with the results of earlier studies (Trites and Price, 1976, 1977) which indicated the importance of psychomotor problem-solving and handedness in relation to difficulty or success in French immersion programs. The importance of teachers' ratings of behavior in predicting relative rates of progress in school has been indicated by Edwards and Smythe (1976) in relation to achievement in French immersion, by Adelman, et al. (1973) and by Atwell, Orpet and Meyers (1967) in relation to progress in regular school programs.

With regard to scores on the Rendement en Français, reading grade level in English and the teachers' rating of conduct problems (Conners scale) were among the ten best predictors from both kindergarten batteries. Thus, there appears to be a transfer of skills between the English and French languages such that reading readiness in the English language in both four- and five-year-old kindergarten is related to achievement in reading in the French language in grade one. Again, teachers' ratings of behavior were important in predicting later success.

The Early Identification Assessment Battery accounted for more than 50% of the variance in scores on four of the seven French criterion variables, namely, the French Comprehension Test, the Test de Rendement en Français, knowledge of numbers in French and picture-naming in French (time). The ten best predictors of each of these four criteria were examined to determine which four-year-old kindergarten predictors were most highly related to later achievement in the French language. Age was among the best ten predictors of the French Comprehension Test, the Test de Rendement en Français and knowledge of numbers in French. FSIQ was among the top ten predictors of scores on the French Comprehension Test, the Rendement en Français and picture-naming the French (time). The French Comprehension

Test and the Rendement en Français shared three predictors among the top ten predictors of these measures, namely, age, FSIQ, and the teachers' rating of inattentive-passive behavior (Conners scale). Age was also one of the best predictors of knowledge of numbers in French and FSIQ was the best predictor of French picture-naming (time). Seven other four-year-old kindergarten predictors were among the ten best predictors of two of these four criterion measures. These predictors included nonverbal IQ (Matrices), picture-naming in English (errors), the Tactual Performance Test, ratings of self-confidence, inattentive-passive behavior, and spoken language, and the four-year-old kindergarten teachers' advice favoring French immersion enrolment. Thus, age and FSIQ measured in four-year-old kindergarten are highly predictive of achievement in French at the end of French immersion grade one. Performance on the Tactual Performance Test and on the test of picture-naming in English were also among the best predictors of later achievement. The remaining predictors of importance were behavior ratings and the teachers' advice regarding French immersion enrolment.

The five-year-old Kindergarten Follow-up Assessment

Battery accounted for more than 50% of the variance in scores on only two measures of French achievement, namely, the French Comprehension Test and the Test de Rendement en Français. The ten best predictors of each of these measures were examined to determine which five-year-old kindergarten predictors were most highly related to later achievement in French. Scores on the Primer level of the French Comprehension Test and on the Peabody Picture Vocabulary Test, knowledge of numbers in French, and ratings of amount of motor activity and of manual dexterity were important predictors of performance on these two criteria. The Tactual Performance Test total time per block and memory component were also important in predicting achievement in French comprehension and reading. Thus, of the five-year-old kindergarten predictors, French language achievement (French Comprehension Test, Primer, and knowledge of numbers in French), receptive vocabulary skills in English, psychomotor problem-solving (Tactual Performance Test) together with ratings of motor activity and manual dexterity best predicted achievement in French in French immersion grade one.

In relation to criterion measures of achievement in English, both sets of predictors accounted for the greatest proportion of variance in WRAT scores and Peabody receptive vocabulary scores. The five-year-old kindergarten measures were better predictors of English reading and spelling scores and of receptive vocabulary scores compared to the four-year-old kindergarten predictors. Compared to the five-year-old kindergarten measures, four-year-old kindergarten measures accounted for a greater proportion of variance in WRAT arithmetic scores and in Renfrew Action Picture Test information and grammar scores. WRAT reading and spelling grade scores in both four-year-old kindergarten and five-year-old kindergarten were among the best predictors of achievement in English reading and spelling in grade one. At both kindergarten levels, picture-naming in English was among the best predictors of reading grade scores. Spelling grade scores at both kindergarten levels, sex and the rating of motor activity were among the best predictors of arithmetic grade scores. Sex, handedness and the rating of effort from both kindergarten batteries were among the best predictors of Peabody receptive vocabulary scores.

The four-year-old kindergarten Early Identification

Assessment Battery accounted for over 50% of the variance in English criterion scores on six of the seven criteria. Little variance in scores on the Peabody Picture Vocabulary Test measure of reading vocabulary was accounted for on the basis of four-year-old kindergarten predictors. The possibility of problems in using the Peabody norms for this novel presentation were discussed in an earlier section. For the remaining six criteria, measures of word segmenting, sex, and five-year-old kindergarten teachers' advice in favor of French immersion enrolment were among the ten best predictors of four criterion measures. Peabody IQ, WRAT spelling scores, the CIRCUS measure of auditory discrimination, handedness, and amount of motor activity were among the ten best predictors of three criterion measures. WRAT reading and spelling scores in four-year-old kindergarten were the best predictors of achievement in English reading and spelling in French immersion grade one. The Tactual Performance Test was among the ten best predictors of expressive language skills in English as measured by the Renfrew Action Picture Test in grade one.

The five-year-old kindergarten predictors accounted for 81% of the variance in WRAT reading grade scores and for 72% of the variance in WRAT spelling grade scores. Scores on the WRAT reading and spelling subtests in five-year-old kindergarten best predicted later achievement on this measure. The five-year-old kindergarten measures also accounted for more than 50% of the variance in WRAT arithmetic grade scores and in Peabody receptive vocabulary scores. WRAT reading, spelling and arithmetic grade scores, the Tactual Performance Test memory component and the teachers' rating of inattentive-passive behavior were among the ten best predictors of three of these four criteria. The five-year-old kindergarten Tactual Performance Test time per block score was among the best predictors of English receptive vocabulary skills and of English grammar skills in French immersion grade one. The memory and location components of the Tactual Performance Test were predictive of achievement in reading and spelling in the grade one program.

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APPENDIX 1

Test Behavior Observation Guide
(Observers' Checklist)

NAME:

Date:

TEST BEHAVIOUR OBSERVATION GUIDE*

A. Amount of motor activity

1. ___ Almost motionless
3. ___ Infrequent movement
5. ___ Average
7. ___ Frequent movement
9. ___ Estreme movement

B. Performance Rate

1. ___ Extremely slow
3. ___ Slow
5. ___ Average
7. ___ Rapid
9. ___ Extremely rapid

C. Manual Dexterity

1. ___ Extremely awkward
3. ___ Awkward
5. ___ Average
7. ___ Skillful
9. ___ Extremely skillful

D. Amount of Speech

1. ___ Mute (practically)
3. ___ Quiet
5. ___ Average
7. ___ Talkative
9. ___ Loquacious

E. Attention

1. ___ Almost impossible to get and hold
3. ___ Easily distracted
5. ___ Moderately attentive
7. ___ Relatively undisturbed by external stimyli
9. ___ Oblivious to external stimuli

F. Anxiety

1. ___ Extremely ill at ease
3. ___ Rather anxious, poorly poised
5. ___ Average social confidence
7. ___ Better than average social confidenc
9. ___ Completely at ease

G. Self-Confidence

1. ___ Painful uncertainty
3. ___ Inclined to distrust own ability
5. ___ Somewhat confident
7. ___ Rather self-confident and assured
9. ___ Completely self confident

H. Effort displayed

1. ___ Indifferent
3. ___ Works perfunctorily
5. ___ Strives for success
7. ___ Works diligently
9. ___ Expends maximum effort

I. Cooperation given to examiner

1. ___ Negativistic, uncooperative
3. ___ Somewhat negativistic
5. ___ Generally good
7. ___ Cooperates readily
9. ___ Cooperates enthusiastically

J. Interest

1. ___ Completely uninterested
3. ___ Lack of interest shown
5. ___ Adequate interest shown
7. ___ Definitely interested
9. ___ Enthusiastic

*A. Atwell, R. Orpet and C. Meyers. Kindergarten behavior ratings as a predictor of academic achievement. J. School Psychology, 1967, 6, 43-46.

APPENDIX 2

Conners' Teacher Questionnaire
(English and French Versions)

CONNERS' TEACHER QUESTIONNAIRE

V Listed below are descriptive terms of behaviour. Place a check mark in the column which best describes this child. ANSWER ALL ITEMS.

Observation	Degree of Activity			
	Not at all	Just a little	Pretty much	Very much
CLASSROOM BEHAVIOUR				
1. Constantly fidgeting				
2. Hums and makes other odd noises				
3. Demands must be met immediately-easily frustrated				
4. Coordination poor				
5. Restless or overactive				
6. Excitable, impulsive				
7. Inattentive, easily distracted				
8. Fails to finish things he starts-short attention span				
9. Overly sensitive				
10. Overly serious or sad				
11. Daydreams				
12. Sullen or sulky				
13. Cries often and easily				
14. Disturbs other children				
15. Quarrelsome				
16. Mood changes quickly and drastically				
17. Acts "smart"				
18. Destructive				
19. Steals				
20. Lies				
21. Temper outbursts, explosive and unpredictable behaviour				
GROUP PARTICIPATION				
22. Isolates himself from other children				
23. Appears to be unaccepted by group				
24. Appears to be easily led				
25. No sense of fair play				
26. Appears to lack leadership				
27. Does not get along with opposite sex				
28. Does not get along with same sex				
29. Teases other children or interferes with their activities				
ATTITUDE TOWARD AUTHORITY				
30. Submissive				
31. Defiant				
32. Impudent				
33. Shy				
34. Fearful				
35. Excessive demands for teacher's attention				
36. Stubborn				
37. Overly anxious to please				
38. Uncooperative				
39. Attendance problem				

How would you rate this child's behaviour compared to other children the same age?

much worse ☐ worse ☐ about the same ☐ better ☐ much better ☐

Do you think this child needs special help?

yes ☐ no ☐

Signature ____________________ Title ____________________ Date Signed ____________________

TRITES, OTTAWA

V. Énumérées ci-dessous sont des termes descriptifs de comportement. Placez un crochet dans la colonne qui décrit le mieux cet enfant. RÉPONDEZ À TOUS LES NUMÉROS.

	Niveau			
Observations	Pas du tout	Un peu	Assez souvent	Beaucoup
COMPORTEMENT EN CLASSE				
1. Toujours remuant.				
2. Fredonne et fait d'autres bruits étranges.				
3. Ses demandes doivent être satisfaites immédiatement – facilement frustré				
4. Pauvre coordination.				
5. Agité ou trop actif.				
6. Excitable, impulsif.				
7. Inattentif, facilement distrait.				
8. Ne finit pas ce qu'il commence; attention de courte durée.				
9. Trop sensible.				
10. Trop sérieux ou triste.				
11. Porté à la rêverie.				
12. Maussade ou boudeur.				
13. Pleure souvent et trop facilement.				
14. Dérange les autres.				
15. Querelleur.				
16. Humeur change vite et radicalement.				
17. Agit rudement.				
18. Est destructeur.				
19. Vole.				
20. Dit des mensonge.				
21. Crises de colère, comportement imprévisible.				
PARTICIPATION EN GROUPE				
22. S'isole des autres enfants.				
23. Ne semble pas être accepté du groupe.				
24. Semble se faire facilement mener.				
25. N'a pas le sens de jouer franc jeu.				
26. Semble manquer des qualités de chef.				
27. Ne s'accorde pas avec le sexe opposé.				
28. Ne s'accorde pas avec le même sexe.				
29. Taquine les autres ou dérange leurs activités.				
ATTITUDE ENVERS L'AUTORITÉ				
30. Soumis, docile.				
31. Défiant.				
32. Effronté.				
33. Resérvé.				
34. Craintif.				
35. Demandes excessives pour l'attention du maître.				
36. Obstiné.				
37. Trop désireux à plaire.				
38. N'est pas coopératif.				
39. Problème d'assiduité scolaire.				

Comment évaluez-vous le comportement de cet enfant comparé à d'autres enfants du même âge?

beaucoup pire ☐ pire ☐ à peu près le même ☐ meilleur ☐
beaucoup meilleur ☐

Signature ____________________ Titre ____________________ Date de signature ____________________

TRITES, OTTAW

APPENDIX 3

Grade One Teacher Ratings
(English and French Versions)

TEACHER RATINGS

GRADE ONE FOLLOW-UP

NAME OF CHILD ______________________________ DATE ______________

A. Compared to the other children in your class, please rate this child on the factors listed below:

Comprehension of French
below average | average | above average

Oral skills in French
below average | average | above average

Reading skills in French
below average | average | above average

Present Functioning Level
early grade 1 | mid-grade 1 | ready for Gr. 2

Willingness and confidence in the French language
below average | average | above average

B. Would you recommend that this child be enroled in French immersion Grade Two in September ?

YES ____ YES, WITH RESERVATIONS ____ NO ____

If YES, please indicate reasons: ______________________________

____

____

If YES, WITH RESERVATIONS, please indicate reservations (for example, "This child will need remedial help in reading in French") : ______

____

____

If NO, please indicate reasons: ______________________________

____

____

C. Did this child encounter any particular difficulties this year?

YES ____ NO ____

Please describe: ______________________________

____

____

D. Did this child need any special help this year?

YES ____ NO ____

Please describe: ______________________________

____

____

EVALUATION DU PROFESSEUR

Nom de l'élève ______________________________ Date ________________

Lorsque vous le comparez aux autres élèves de sa classe, à quel niveau se situe cet élève dans les habiletés suivantes?

Compréhension du français	en dessous de la moyenne	moyen	au dessus de la moyenne
Expression orale française	en dessous de la moyenne	moyen	au dessus de la moyenne
Lecture du francais	en dessous de la moyenne	moyen	au dessus de la moyenne
Niveau général du rendement	début de la 1ère année	milieu de la 1ère année	prêt pour la 2ième année

Niveau d'intérêt et de confiance dans l'utilisation du francais

en dessous de la moyenne	moyen	au dessus de la moyenne

Est-ce que vous recommanderiez que cet élève soit placé en classe d'immersion de 2ième année en septembre prochain?

OUI _____ OUI, MAIS AVEC DES RESTRICTIONS _____ NON _____

Si vous répondez OUI, indiquez les raisons qui vous poussent à ce choix.

____

____

Si vous répondez OUI, MAIS AVEC DES RESTRICTIONS indiquez les raisons derrière ce choix: (par exemple, "Cet enfant aura besoin d'aide supplémentaire dans la lecture du français")

____

____

____

____

Si vous répondez NON, indiquez les raisons de ce choix____________

____

____

Cet enfant a-t-il éprouvé des difficultés particulières à l'école cette année?

OUI _____ NON _____

Décrivez, s'il vous plait:______________________________________

____

A-t-il eu besoin d'aide supplémentaire?

OUI _____ NON _____

Décrivez, s'il vous plait:______________________________________

____

Croyez-vous qu'il aura besoin d'aide supplémentaire l'année prochaine?

OUI _____ NON _____

____

____

APPENDIX 4

Parent Ratings - Grade One Follow-up

PARENT RATINGS

grade one follow-up

Any information you may give on the enclosed form will not be placed in the child's school record. It will be kept strictly confidential by the research team from the Neuropsychology Laboratory of the Royal Ottawa Hospital.

Child's name ______________________________ Age ______________

Birth date ____________________

Month Day Year

School ________________________________

Teacher ______________________________

Which school program is your child attending at the present time?

Regular English grade 1 ____

French immersion grade 1 ____

Bilingual grade 1 ____

Other. Please specify ______________________________

Which school program did your child attend for 5-year-old kindergarten?

French immersion 5-year-old kindergarten ____

Regular English 5-year-old kindergarten ____

Bilingual 5-year-old kindergarten ____

Other. Please specify ______________________________

Has your child encountered any particular difficulties in school this past year?

YES ____ NO ____

If YES, please describe ______________________________

____

Has your child received any special help in school during this past year?

YES _____ NO _____

If YES, please describe ____

____

Are you satisfied with your child's progress in developing reading and spelling skills in the French immersion grade 1 program?

YES _____ NO _____ NOT APPLICABLE _____

Are you satisfied with your child's progress in developing reading and spelling in the regular English grade 1 program?

YES _____ NO _____ NOT APPLICABLE _____

Are you satisfied with your child's progress in developing reading and spelling skills in the bilingual grade 1 program ?

a) in English? YES _____ NO _____ NOT APPLICABLE _____

b) in French? YES _____ NO _____ NOT APPLICABLE _____

Are you satisfied with your child's progress in developing social skills in the French immersion grade 1 program?

YES _____ NO _____ NOT APPLICABLE _____

Are you satisfied with your child's development of social skills in the regular English grade 1 program?

YES _____ NO _____ NOT APPLICABLE _____

Are you satisfied with your child's progress in developing social skills in the bilingual grade 1 program?

YES _____ NO _____ NOT APPLICABLE _____

Which school program will your child attend next year (Sept 1979) ?

French immersion grade 2

English grade 2

Bilingual grade 2

Repeat French immersion grade 1

Repeat English grade 1

Repeat bilingual grade 1

Other. Please specify____________________

Will your child need any special help in school next year?

YES _____ NO _____ DON'T KNOW _____

Please indicate the reasons for your choice of a school program for next year (Sept 1979).

a) French immersion grade 2____________________

b) English grade 2____________________

c) Bilingual grade 2____________________

d) Other____________________

If your child has been transferred from the French immersion program to a regular English program, please complete the following section:

When did your child transfer to the English program?______________

____

How long was your child in French immersion?______________

____

Date of transfer______________________________

Please indicate the reasons for the transfer to the English program:

____

____

Was the transfer to the English program suggested by school authorities?

YES _____ NO _____

If YES, what reasons did they give for suggesting the transfer?

____

____

Were you in agreement with the school authorities?

YES NO

Please describe______________________________

____

Were you satisfied with your child's progress in French immersion?

YES _____ NO _____

Are you satisfied with your child's progress in the English program?

YES _____ NO _____

Did your child like the French immersion program?

YES _____ NO _____

Does your child like the English program?

YES _____ NO _____

Do your intend to enrol your child in a French immersion program in the future?

YES ______ NO ______ UNDECIDED ______

If YES, please indicate reasons ______________________________

____

If NO, please indicate reasons ______________________________

____

Present address and phone number ______________________________

First and last name of parents ______________________________

THANK YOU

APPENDIX 5

Biographical and Background Information Questionnaire

BIOGRAPHICAL AND BACKGROUND INFORMATION

This information will not be put into school files. It will be kept confidential by the research team from the Neuropsychology Laboratory, Royal Ottawa Hospital.

1. Name of child in junior kindergarten ______________________
   First Last

2. Age __________

3. Birthdate ______________ Today's date ______________
   Month Day Year Month Day Year

4. Sex Male ☐ Female ☐

5. School ______________

6. Teacher ______________

7. Which hand does your child tend to prefer for pencil work?
   Right ☐ Left ☐ No preference ☐

8. Handedness of parents for writing: Mother Right ☐ Father Right ☐
   Left ☐ Left ☐

9. Are any of your other children left-handed?
   Yes ☐ No ☐ There are no other children ☐

10. Does your child have any special needs or handicaps? NO ☐
    Speech therapy ☐
    Hearing aid ☐
    Medications ☐ If so, which ones? ______________
    Other (Please specify) ______________

11. Did your child attend a Day Care Centre?
    Did not attend ☐
    Attended half day ☐ starting date, month _____ year _____
    ending date, month _____ year _____
    Attended full day ☐ starting date, month _____ year _____
    ending date, month _____ year _____
    Name and location of Centre(s) ______________

12. Did your child attend a Nursery School?
    Did not attend ☐
    Attended half day ☐ starting date, month _____ year _____
    ending date, month _____ year _____
    Attended full day ☐ starting date, month _____ year _____
    ending date, month _____ year _____
    Name and location of Centre(s) ______________

Child's Name ____________________

13. Is your child presently attending a Nursery School or Day Care Centre as well as junior kindergarten?

Nursery School: Yes ☐ No ☐
Day Care Centre: Yes ☐ No ☐

14. What language is most often spoken in your home: Check one box only.

English ☐
French ☐
Italian ☐
German ☐
Other (Please specify) ____________________

15. What additional languages are spoken in your home?

None ☐ or, (specify) ____________________

16a. Do you speak French? Mother: Yes ☐ No ☐ Father: Yes ☐ No ☐

16b. If no, do you want to learn to speak French?

Mother: Yes ☐ No ☐ Father: Yes ☐ No ☐

17. Have you taken a French course other than in elementary school or in high school?

Mother: Yes ☐ No ☐ Describe ____________
Father: Yes ☐ No ☐ Describe ____________

18. Does your child hear French spoken in the home? Yes ☐ No ☐

19. Does your child hear French spoken in the neighbourhood? Yes ☐ No ☐

20a. Do you intend to enrol your child in French immersion kindergarten in September, 1977? Yes ☐ No ☐

20b. If no, what are your reasons for not enrolling your child in French immersion? ____________________

____

____

20c. If yes, what are your reasons for enrolling your child in French immersion? ____________________

____

____

Child's Name ______________________

21. Speaking generally, do you think that a child needs to have any special characteristics to do well in French immersion? Yes ☐ No ☐

Describe ____

____

22a. Have you enrolled any of your other children in French immersion?

Yes ☐ No ☐

22b. If yes, how many? ______________________

Describe their program(s) (for example, grade 7 late immersion) _____

____

____

22c. Have any of your children had diffficulty in French immersion?

Yes ☐ No ☐ Not applicable ☐

Describe any difficulties ______________________________

____

23. What is father's occupation? Please describe your present job and the type of organization you work in. Examples: "Shoe salesman in a department store", "Stenographer, Level 2 in the Federal Government", "Owner-manager of a small Supermarket." (If you are not presently working outside of the home, please indicate present situation, e.g. student) ______________

____

____

24. What is mother's occupation? Please describe your present job and the type of organization you work in. Examples: See Question #23. (If you are not presently employed outside of the home, please indicate present situation, e.g. housewife, student) ______________________________

____

____

25. About how often is your child read to at home?

☐ occasionally; ☐ once or twice a week; ☐ several times a week; ☐ almost every night

Child's Name____________________________

26. About how many books (hard or soft cover) do you have in your home?

    0-10 ☐
    11-30 ☐
    31-60 ☐
    61-100 ☐
    101-200 ☐
    201-499 ☐
    500 or more ☐

27. About how many of these are "children's books"?

    ☐ None ☐ Some ☐ Most ☐ Almost all

PLEASE NOTE THAT THIS IS NOT A REGISTRATION FORM. THE SCHOOL WILL CONTACT YOU ABOUT FRENCH IMMERSION SENIOR KINDERGARTEN REGISTRATION.

Form filled in by: Name ____________________________________

Address____________________________________

____

APPENDIX 6

Four-year-old Kindergarten Teachers' Ratings

TEACHER'S RATINGS

Date________________

Four-year-old Kindergarten

Name of Child_____________________________________
First Last

Teacher_____________________________________

School_____________________________________

Please rate the child on the following 3-point scales by placing a check mark above the appropriate category:

Ability:	below average	average	above average
Social Maturation:	below average	average	above average
Motivation:	below average	average	above average

Do you think that this child will have particular difficulty in school? Yes ☐ No ☐

If Yes, for what reason(s):

- Below average ability ☐
- Language difficulties ☐
- Immature ☐
- Cannot concentrate ☐
- Emotional or social adjustment problems ☐
- Not motivated ☐

Other (please list)_____________________________________

____

____

Do you think it advisable that this child be enrolled in French immersion kindergarten in September, 1977?

Yes ☐ No ☐

Please indicate reasons_____________________________________

____

____

APPENDIX 7

Five-year-old Kindergarten Teachers' Ratings (English and French Versions)

TEACHER RATINGS

five-year-old kindergarten

NAME ______________________________

Compared to the other children in your class, please rate this child on the factors listed below:

Comprehension of French	Below Average	Average	Above Average
Oral skills in French	Below Average	Average	Above Average
Present functioning level	Early Kg	Mid Kg	Ready for gr 1

Would you recommend that this child be enrolled in French immersion grade 1 in Sept, 1978?

☐ yes ☐ no

If Yes please indicate reasons ______________________________

If No, please indicate reasons ______________________________

Did this child encounter any particular difficulties this year?

☐ yes ☐ no

Please describe ______________________________

Did this child need any special help this year?

☐ yes ☐ no

Please describe ______________________________

____

Will this child need any special help next year?

☐ yes ☐ no

Please describe ______________________________

____

EVALUATION DU PROFESSEUR

NOM ____

A comparer aux autres enfants de votre classe, évaluez s'il-vous-plait cet enfant sur les critères mentionnés ci-dessous:

Compréhension en Français	en dessous de la moyenne	moyen	au-dessus de la moyenne
Habilité orale en Français	en dessous de la moyenne	moyen	au-dessus de la moyenne
Présentement à quel niveau évolue l'enfant?	prématernell	maternelle	prêt (e) pour la première année

Recommanderiez-vous que cet enfant soit inscrit(e) en immersion Française (Grade I) en septembre 1978?

☐ oui ☐ non

Si oui, indiquez les raisons: ____

____

____

Si non, indiquez les raisons: ____

____

____

Est-ce que cet enfant a démontré des difficultés particulières cette année?

☐ oui ☐ non

Décrivez s'il-vous-plaît: ____

____

Est-ce que cet enfant a eu besoin d'aide particulière cette année?

☐ oui ☐ non

Décrivez s'il-vous-plaît ____

____

Est-ce que cet enfant aura besoin d'aide particulière l'année prochaine?

☐ oui ☐ non

Décrivez s'il-vous-plaît ____

____

APPENDIX 8

Early Identification Assessment Battery (four-year-old kindergarten)

Early Identification Assessment Battery

(four-year-old kindergarten)

- Age
- Sex
- Dominance
- Wechsler Preschool and Primary Scale of Intelligence (WPPSI)
- Peabody Picture Vocabulary Test:
  - Mental Age
  - IQ
- Raven Coloured Matrices Test
- Wide Range Achievement Test (WRAT)
- Dominance demonstrations (handedness)
- Tactual Performance Test (3 block formboard)
- Picture-naming
- Colour-naming
- Word segmenting:
  - words segmented in any way
  - words segmented at syllable boundaries
- Renfrew Action Picture Test:
  - Information
  - Grammar
- CIRCUS: An Assessment Program for Pre-primary Children:
  - #2: How much and how many
  - #5: Finding letters and numbers
  - #7: How words sound
  - #9: Listen to the story
  - #13: Think it through
- Observers' Checklist:
  - A Amount of motor activity
  - B Performance rate
  - C Manual dexterity
  - D Amount of speech
  - E Attention
  - F Anxiety
  - G Self-confidence
  - H Effort displayed
  - I Cooperation given to examiner
  - J Interest
- Conners' Teacher Questionnaire:
  - Conduct problem
  - Inattentive-passive
  - Tension-anxiety
  - Hyperactivity
- Myklebust Pupil Rating Scale:
  - Auditory comprehension
  - Spoken language
  - Orientation
  - Motor coordination
  - Personal-social behavior

APPENDIX 9

Kindergarten Follow-up Assessment Battery
(five-year-old kindergarten)

Kindergarten Follow-up Assessment Battery

- Age
- French Comprehension Test, Primer
- Peabody Picture Vocabulary Test:
  - Mental Age
  - IQ
- Word Segmenting:
  - Words segmented in any way
  - Words segmented at syllable boundaries
- Tactual Performance Test (6 block board)
- Picture-naming (French)
- Letter naming (French)
- Counting/number naming (French)
- Wide Range Achievement Test (WRAT)
- CIRCUS: An Assessment Program for Pre-primary Children:
  - #9 Listen to the Story
  - #13 Think it Through
- Conners Teacher Questionnaire:
  - Conduct problem
  - Inattentive-passive
  - Tension-anxiety
  - Hyperactivity
- Observers' Checklist:
  - A Amount of motor activity
  - B Performance rate
  - C Manual dexterity
  - D Amount of Speech
  - E Attention
  - F Anxiety
  - G Self-confidence
  - H Effort displayed
  - I Cooperation given to examiner
  - J Interest

APPENDIX 10

Four-year-old and Five-year-old Kindergarten Variables used in the Discriminant Function Analyses of Drop-outs versus Low Achievers and High Achievers in French Immersion

38 Four-year-old Kindergarten Variables

- Age
- SES
- FSIQ
- Peabody IQ
- Matrices (raw score)
- WRAT:
  - Reading grade score
  - Spelling grade score
  - Arithmetic grade score
- Picture-naming:
  - Time
- Colour-naming
- Word segmenting:
  - Syllables
- Observers' Checklist:
  - A Amount of motor activity
  - B Performance rate
  - C Manual dexterity
  - D Amount of speech
  - E Attention
  - F Anxiety
  - G Self-confidence
  - H Effort displayed
  - I Cooperation
  - J Interest
- Renfrew Action Picture Test:
  - Information
  - Grammar
- Conners Teacher Questionnaire:
  - Conduct problem
  - Inattentive-passive
  - Anxiety
  - Hyperactivity
- Myklebust Pupil Behavior Rating Scale:
  - Auditory comprehension
  - Spoken language
  - Orientation
  - Motor coordination
  - Personal-social behavior
- CIRCUS:
  - #2 How Much and How Many
  - #5 Finding Letters & Numbers
  - #7 How Words Sound
  - #9 Listen to the Story
  - #13 Think it Through
- Tactual Performance Test
  - Total time per block (3 block board)

31 Five-year-old Kindergarten Variables

- Age
- Peabody IQ
- Renfrew Action Picture Test:
  - Information
  - Grammar
- Word segmenting:
  - Syllables
- Picture-naming:
  - Time
  - Errors
- WRAT:
  - Reading grade score
  - Spelling grade score
  - Arithmetic grade score
- Tactual Performance Test:
  - Memory
  - Location
  - Total time per block (6 block board)
- Knowledge of the alphabet (French)
- Knowledge of numbers (French)
- CIRCUS:
  - #9 Listen to the Story
  - #13 Think it Through
- Observers' Checklist:
  - A Amount of motor activity
  - B Performance rate
  - C Manual dexterity
  - D Amount of speech
  - E Attention
  - F Anxiety
  - G Self-confidence
  - H Effort displayed
  - I Cooperation
  - J Interest
- Conners Teacher Questionnaire:
  - Conduct problem
  - Inattentive-passive
  - Anxiety
  - Hyperactivity

APPENDIX 11

Test Names and Abbreviations

Variable Name	Computer Code
I. **Early Identification Assessment Battery:**	
AGE	AGE
SEX	SEX
DOMINANCE	DOM
WPPSI: Verbal IQ	VIQ
Performance IQ	PIQ
Full Scale IQ	FSIQ
Information	INF
Vocabulary	VOC
Arithmetic	ARTH
Similarities	SIM
Comprehension	COMP
Sentences	SENT
Animal House	AH
Picture Completion	PC
Mazes	MAZ
Geometric Design	GD
Block Design	BD
PEABODY: Mental Age	PEABMA
IQ	PEABIQ
MATRICES: Raw Score	MATRS
Percentile	MATSS
(Norms: age 5 1/2	
WRAT: Reading grade score	WRAR
Spelling grade score	WRAS
Arithmetic grade score	WRAA
Reading percentile	WRARP
Spelling percentile	WRASP
Arithmetic percentile	WRAAP
(for Ss age 5.0 years)	
DOMINANCE DEMONSTRATIONS: # Right	DOMR
# Left	DOML
TACTUAL PERFORMANCE TEST: (3 block board):	
Right hand: time	FRHT
Right hand: # blocks	FRHB
Left hand: time	FLHT
Left hand: # blocks	FLHB
Both hands: time	FBT
Both hands: blocks	FBB
Both time	FTOTT
Total # blocks	FTOTB
Dominant hand: time	FDOMT
Dominant hand: # blocks	FDOMB
Nondominant hand: time	FNONT
Nondominant hand: # blocks	FNONB

Variable Name		Computer Code
TIME PER BLOCK:	Both hands	TPBBOTH
	Total	TPBTOTAL
	Dominant hand	TPBDOMIN
	Nondominant hand	TPBNODOM
PICTURE NAMING:	Time	PICTIME
	# Errors	PICERR
COLOUR NAMING:	# Correct	COLCOR
WORD SEGMENTING:		
	TOTAL # words segmented in any way	SEGTOT
	PARTIAL # words segmented in any way	SEGPART
	TOTAL # words segmented - syllable boundaries	SYLTOT
	PARTIAL # words segmented - syllable boundaries	SYLPART
OBSERVERS' CHECKLIST:		
	A - Amount of motor activity	OBSA
	B - Performance rate	OBSB
	C - Manual dexterity	OBSC
	D - Amount of speech	OBSD
	E - Attention	OBSE
	F - Anxiety	OBSF
	G - Self-confidence	OBSG
	H - Effort displayed	OBSH
	I - Cooperation given to examiner	OBSI
	J - Interest	OBSJ
RENFREW ACTION PICTURE TEST:	Information	RENINF
	Grammar	RENGRAM
CONNERS TEACHER QUESTIONNAIRE:		
	Conduct problem	CONPROB
	Inattentive-passive	CONPASS
	Tension-anxiety	CONANX
	Hyperactivity	CONHYP
	Total	CONTOT
MYKLEBUST PUPIL RATING SCALE (Teachers)		
	Auditory comprehension	AUDCOMP
	Spoken language	SPOKLAN
	Orientation	ORIEN
	Motor coordination	MOTCOR
	Personal-social behavior	PERSOC
	Verbal score	VERB
	Nonverbal score	NONVERB
	Total score	MYKTOT

Variable Name		Computer Code
CIRCUS:		
#2:	How Much and How Many	CIR2TOT
#5:	Finding Letters and Numbers	CIR5TOT
#7:	How Words Sound	CIR7TOT
#9:	Listen to the Story	CIR9TOT
#13:	Think it Through	CIR13TOT

II. Kindergarten Follow-up Assessment Battery

AGE	XAGE
FRENCH COMPREHENSION TEST, Primer:	
Raw	XFRCOMPR
Percentile	XFRCOMPP
PEABODY:	
Mental Age	XPEABMA
IQ	XPEABIQ
RENFREW ACTION PICTURE TEST:	
Information	XRENINF
Grammar	XRENGRM
WORD SEGMENTING:	
TOTAL # words segmented in any way	XSEGTOT
TOTAL # words segmented - syllable boundaries	XSEGSYL
TACTUAL PERFORMANCE TEST: (6 block board):	
Right hand: time	XFRHT
Right hand: # blocks	XFRHB
Left hand: time	XFLHT
Left hand: # blocks	XFLHB
Both ahnds: time	XFBHT
Both ahnds: # blocks	XFBHB
Dominant hand: time	XFDOMT
Dominant hand: # blocks	XFDOMB
Nondominant hand: time	XFNONT
Nondominant hand: # blocks	XFNONB
Total time	XFTOTT
Total blocks	XFTOTB
Memory	XMEM
Location	XLOC
TIME PER BLOCK:	
Right hand	XRHTPB
Left hand	XLHTPB
Both hands	XBOTHTPB
Total	XTOTTPB
Dominant hand	XDOMTPB
Nondominant hand	XNONTPB

Variable Name	Computer Code
PICTURE NAMING (French):	
Time	XPICTIM
Errors	XPICERR
WRAT (English):	
Reading percentile	XWRARP
Spelling percentile	XWRASP
Arithmetic percentile	XWRAAP
Reading grade score	XWRARG
Spelling grade score	XWRASG
Arithmetic grade score	XWRAAG
LETTER NAMING (French)	XFWRAR
COUNTING/NUMBER NAMING (French)	XFWRAA
CIRCUS:	
#9: Listen to the Story	XCIR9T
#13: Think it Through	XCIR13T
CONNERS TEACHER QUESTIONNAIRE:	
Conduct problem	XCONCP
Inattentive-passive	XCONIP
Tension-anxiety	XCONTA
Hyperactivity	XCONHY
Total	XCONT
OBSERVERS' CHECKLIST:	
A - Amount of motor activity	XOBSA
B - Performance rate	XOBSB
C - Manual dexterity	XOBSC
D - Amount of speech	XOBSD
E - Attention	XOBSE
F - Anxiety	XOBSF
G - Self-confidence	XOBSG
H - Effort displayed	XOBSH
I - Cooperation given to examiner	XOBSI
J - Interest	XOBSJ

III. Grade One Follow-up Assessment Battery

			Computer Code
FRENCH COMPREHENSION TEST, Level One:			
Raw			YFRCOMPR
Percentile			YFRCOMPP
PEABODY:	Form B (receptive):	Mental Age	YPEABMAB
		IQ	YPEABIQB
	Form A (reading):	Mental Age	YPEABMAA
		IQ	YPEABIQA
	Form B - Form A:		YBA

Variable Name	Computer Code
WRAT:	
Reading grade score	YWRARG
Reading percentile	YWRARP
Spelling grade score	YWRASR
Spelling percentile	YWRASP
Arithmetic grade score	YWRAAR
Arithmetic percentile	YWRAAP
RENFREW ACTION PICTURE TEST:	
Information	YRENINF
Grammar	YRENINF
PEABODY: French Form A: Mental Age	YFRPEAMA
IQ	YFRPEAIQ
KNOWLEDGE OF NUMBERS IN FRENCH:	YFWRAA
KNOWLEDGE OF ALPHABET IN FRENCH:	YFWRAR
PICTURE-NAMING IN FRENCH:	
Time	YPICTIM
Errors	YPICERR
TEST DE RENDEMENT EN FRANCAIS:	
Raw	YRENDR
Stanine	YRENDS
OBSERVERS' CHECKLIST:	
A - Amount of motor activity	YOBSA
B - Performance rate	YOBSB
C - Manual dexterity	YOBSC
D - Amount of speech	YOBSD
E - Attention	YOBSE
F - Anxiety	YOBSF
G - Self-confidence	YOBSG
H - Effort displayed	YOBSH
I - Cooperation given to examiner	YOBSI
J - Interest	YOBSJ
CONNERS TEACHER QUESTIONNAIRE:	
Conduct problem	YCONP
Inattentive-passive	YCONIP
Tension-anxiety	YCONTA
Hyperactivity	YCONHY
Total	YCONT

APPENDIX 12

Predictor and Criterion Variables Included in the Multiple Regression Analyses

14 Criterion Variables
Grade One

I. French Achievement

- French Comprehension Test, Level one
- Test de Rendement en Français, Level one
- Peabody Picture Vocabulary Test (French)
- Knowledge of the alphabet in French
- Knowledge of Numbers in French
- Picture-naming in French
  - i) Time
  - ii) Errors

II. English Achievement

- Peabody Picture Vocabulary Test
  - i) Receptive Vocabulary
  - ii) Reading Vocabulary
- Wide Range Achievement Test
  - i) Reading
  - ii) Spelling
  - iii) Arithmetic
- Renfrew Action Picture Test
  - i) Information
  - ii) Grammar

43 Predictors
(Four-year-old Kindergarten)

- Age
- SES
- FSIQ
- Peabody IQ
- Matrices
- WRAT: Reading Grade
  - Spelling Grade
  - Arithmetic Grade
- Picture-naming: Time
  - Errors
- Word Segmenting (syllables)
- Renfrew Action Picture Test:
  - Information
  - Grammar
- CIRCUS:
  - #2: How Much and How Many
  - #5: Finding Letters and Numbers
  - #7: How Words Sound
  - #9: Listen to the Story
  - #13: Think it Through
- Tactual Performance Test
- Observers' Checklist:
  - A Amount of Motor Activity
  - B Performance Rate
  - C Manual Dexterity
  - D Amount of Speech
  - E Attention
  - F Anxiety
  - G Self-confidence
  - H Effort Displayed
  - I Cooperation
  - J Interest
- Conners Teacher Questionnaire
  - Conduct problem
  - Inattentive-passive
  - Tension-anxiety
  - Hyperactivity
- Myklebust Pupil Rating Scale
  - Auditory Comprehension
  - Spoken Language
  - Orientation
  - Motor Coordination
  - Personal-Social Behavior
- D1 - Sex
- D2 - Handedness
- D3 - Preschool Attendance
- D4 - Four-Year-Old Kindergarten Teachers' Advice in Favor of French Immersion Enrolment
- D5 - Four-Year-Old Kindergarten Teachers' Advice Against French Immersion Enrolment

34 Predictors
(Five-year-old Kindergarten)

- Age
- French Comprehension Test, Primer
- Peabody IQ (English)
- Renfrew Action Picture Test:
  - Information
  - Grammar
- Word Segmenting (syllables)
- WRAT: Reading Grade
  - Spelling Grade
  - Arithmetic Grade
- CIRCUS:
  - #9: Listen to the Story
  - #13: Think it Through
- Tactual Performance Test:
  - Total time per block
  - Memory
  - Location
- Picture-naming (French):
  - Time
- Knowledge of the Alphabet in French
- Knowledge of Numbers in French
- Observers' Checklist:
  - A Amount of Motor Activity
  - B Performance Rate
  - C Manual Dexterity
  - D Amount of Speech
  - E Attention
  - F Anxiety
  - G Self-confidence
  - H Effort Displayed
  - I Cooperation
  - J Interest
- Conners Teacher Questionnaire
  - Conduct problem
  - Inattentive-passive
  - Tension-anxiety
  - Hyperactivity
- D1 - Sex
- D2 - Handedness
- D3 - Five-Year-Old Kindergarten Teachers' Advice re French Immersion enrolment